



LAKE COUNTY MASTER BROADBAND PLAN UPDATE

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In Conjunction with

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and

Global BrandStrategy

and

in Association with the

Lake County Administrative Office

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I. <u>EXECUTIVE SUMMARY</u>

CBG Communications, Inc. (CBG) in conjunction with the County of Lake, California (County), has developed an update to the County's November 2019 Master Broadband Plan that focuses on the state of broadband availability as well as the state of broadband adoption in the County, nearly four years later, as of September 2023. This Updated Master Broadband Plan (variously referred to herein as "Updated Plan", "Plan Update", or "2023 Plan"), reflects a sea change in the need for high-capacity access to the Internet since the 2019 Plan was developed. This includes changes initially as a result of the COVID-19 pandemic, requiring a move to services provided through online and virtual means, such as telehealth, tele-education, and telework, and then evolving into a hybrid world.

As reflected in the Updated Plan, technology has also evolved rapidly, such that the prior definition of minimum broadband at 25 megabits per second (Mbps) download / 3 Mbps upload is now considered underserved, instead focusing on minimum speeds of 100 Mbps downloads / 20 Mbps upload in order to be considered served, with the ultimate goal to be at least at 100 Mbps symmetrical.

As described in the Updated Plan, the majority of the geographic area of Lake County and nearly one fifth of its population is considered at least underserved, with a significant portion unserved. The Updated Plan delineates current broadband availability by both wireline and wireless Internet providers. It then focuses on a variety of areas for projects that will be more finitely defined in the next phase of the County's broadband expansion and enhancement project, the Lake County Broadband Implementation Plan.

The Updated Plan describes in great-detail, though, how expanding broadband availability is only one part of the solution to achieving digital equity in the County. Specifically, there are many inhibitors to broadband adoption, for all major sectors, as well as many businesses and residents. These inhibitors include: unreliable access to broadband in many cases where it's available; lack of necessary devices for access; lack of affordable access, and alternatively, insufficient free public access; the need for more education and training; and a perceived low value of broadband/Internet on the part of some.

Much of the data reflected in the 2023 Plan is incorporated in a multi-layer, interactive broadband map which can be found at:

https://brandstrategy.maps.arcgis.com/apps/instant/sidebar/index.html?appid=0383dfc2 b43040a69324260f80172a2c

Near the conclusion of the Updated Plan, a number of recommendations are made for actions, initiatives and strategies that should be the focus of the ensuing Broadband Implementation Plan. This includes: broadband deployment-enhancing right-of-way (ROW) management processes; developing partnerships with the broadband provider community; working synergistically with Tribal Nations in the Lake County area; working





on a regional basis with multiple stakeholders; expanding very high-capacity access (1 gigabit per second symmetrical service) to community anchor institutions, which in turn can help expand public access to the Internet and support expansion and adoption spurring efforts; working with the provider community to improve the reliability and resiliency of their system; and engaging the entire Lake County community in an ongoing effort to help assess how well availability and adoption-spurring efforts are working for their benefit.

Overall, the Updated Plan that follows provides a solid foundation to build upon and move forward with the development of a successful Lake County Broadband Implementation Plan.

A. Acknowledgements

CBG wishes to thank myriad people and organizations, without which it would not have been possible to develop this Plan Update. These include, but are not limited to: CBG's Staff, including Tom Robinson, President and CEO; Dick Nielsen, Senior Engineer; and Krystene Rivers, Research Associate; and CBG's Team Partners, including Telecommunications Research Corporation, Constance Book, PhD, President, John Horrigan, PhD and Zoie Browder, Research Assistant; and Global BrandStrategy, Andrew Entrikin, GIS Specialist.

CBG also wishes to thank all the Lake County governmental agency and educational organization representatives who provided critical information for review, analysis and incorporation into especially Section IV of the Report concerning broadband demand, drivers and adoption, and especially our project coordinators at the County, Benjamin Rickelman, Deputy County Administrative Officer II - Economic Development; and Matthew Rothstein, Deputy County Administrative Officer/Public Information Officer.

CBG further wishes to thank representatives of the Tribal Nations who provided key information related to the Tribes' efforts concerning broadband deployment and adoption.

Additionally, the assistance of multiple members of the business community, especially the Lake County Economic Development Corporation and the Lake County Chamber of Commerce, as well as business associations and many individual businesses, was critical in gaining invaluable insight concerning the impacts of broadband (or lack thereof) on business and economic development in the County.

Also, detailed input from members of the broadband and Internet Service Provider community in Lake County was crucial in understanding the challenges regarding broadband deployment in the County and exploring viable options for broadband expansion and enhancement.

CBG also appreciates the input received from all the residents who took the time to respond to the broadband survey.





Finally, CBG wishes to thank Susan Parker, the County Administrative Officer, and the members of the Lake County Board of Supervisors and Planning Commission for their important input on public policy goals related to expansion and enhancement of broadband in Lake County.





II. INTRODUCTION AND BACKGROUND

CBG Communications, Inc. (CBG) was hired by the County of Lake, California (County) to develop an update to the County's November 2019 Master Broadband Plan (2019 Plan)¹ and, based on the updated information, prepare a Broadband Implementation Plan for the County. The document that follows is the Updated Master Broadband Plan ("Updated Plan", "Plan Update" or "2023 Plan"), and focuses both on the state of broadband availability (including existing coverage by broadband providers and corresponding gaps in coverage in the County), as well as the state of broadband adoption (including those that currently access broadband as well as those that do not for a variety of reasons), as of September, 2023, or nearly four years after the initial Plan was prepared.

As described in the Updated Plan that follows, there has been a sea change in the need for access to the Internet, especially at the speeds and with the capacity that broadband provides, as well as a push at the Federal, State of California (State) and local levels to work to meet that need since the initial Plan was developed, because of the COVID 19 pandemic. Specifically, the pandemic's stay-at-home orders and associated need to shift primarily to virtual telework, tele-learning (tele-education) and tele-medicine (tele-health) caused nearly everyone (employers, employees, parents, teachers and students, doctors and patients, etc.) to need more reliable, higher capacity and uniform access to the Internet.

Because such uniform access was not available at the beginning of the pandemic, multiple efforts, methods, support mechanisms and the like needed to be quickly put in place in order to respond to the need. Additionally, the pandemic was not short-lived; it lasted into weeks and then months and then years. Because of this, short-term solutions were not viable, so it was determined at all levels that this sea change needed to take place to provide and promote the kind of access that would not only facilitate the continuation of necessary activities in the face of potential future pandemics or other public health and other emergencies, but provide more efficient and effective work, education, health-related and other associated operations going forward.

In other words, the response to the pandemic and the sea change needed would help propel all residents, businesses and institutions into a digitally equitable society. Such has not been achieved yet and, as shown in the Updated Plan that follows, there are still many hurdles to overcome.

However, strides are being taken and there are many activities occurring that are attempting to continue to move what's been termed as the "digital transformation" ahead. Some of the largest broadband-related changes that have occurred since 2019 (as more fully described in the Updated Plan below) are:

¹ See Lake County Master Broadband Plan - Telecommunications Infrastructure, Upstate California Connect Consortium and CSU Chico, Geographical Information Center, November 2019.





• **Broadband Technology** -- There has been a substantial push to overbuild old copper-based telephone infrastructure with fiber optic cabling. Fiber optic cabling provides the capacity for data communications speeds that are hundreds of times faster to support the high-capacity access needed by residents, business and institutions.

Beyond this, the broadband service offerings of traditional cable tv providers continue to increase in capacity and move toward symmetrical upload and download speeds which, while they can't match the capacity of the highest levels of service enabled by fiber optic cabling, will provide the types of speeds that the Federal and State governments have indicated are those needed by consumers.²

Beyond advances in wireline technology, wireless technology continues to advance as well, especially with fixed wireless based on cellular broadband providers using Fifth Generation (5G) technology. This includes use by providers for general consumer access to the public Internet, and also for private wireless enterprise networks (such as large campus environments) with what's known as Private 5G.

- Accuracy of Broadband Mapping -- It was clear when the pandemic began and substantial gaps in coverage between broadband "haves" and "have-nots" were identified anecdotally, that the existing Federal Communications Commission (FCC) broadband maps were majorly inaccurate.³ The need for accurate data required a substantial revamping in the way that broadband providers reported broadband availability information, and the way that such information was mapped. Additionally, a "challenge" process was put in place where localities and even individual residents could challenge the information on the maps which in turn lead to more advanced verification. Such efforts continue to update the accuracy of the map. This much more highly accurate data set now enables better evaluation of broadband coverage and associated gaps in coverage and, as a result, better planning for more efficient and effective future deployment.
- Identification of and Response to Digital Inequity -- It was evident that those that had insufficient access to the Internet (including for a variety of reasons beyond lack of availability, such as issues with affordability, education and training, access to necessary devices, and related issues) were much less able

³ Prior to the push to improve the FCC's broadband availability maps which culminated in substantially improved maps in November 2022, and now even more accurate updated maps in 2023, the FCC indicated that an entire census block was served by broadband, if only one residence within that block was served, leading to a substantially inaccurate understanding of where broadband was and wasn't. As explained in detail in the Plan Update, the maps are now individual location-based and can be analyzed down to individual homes and businesses on individual streets.



² The Federal National Telecommunications and Information Administration (NTIA) has determined that speeds of 100 megabits per second (Mbps) upload and 100 Mbps download are needed to adequately participate in today's digital society by residents and small and medium businesses. Larger businesses and institutions need speeds of 1 gigabit per second (Gbps) download and 1 Gbps upload speeds to function at a high level based on the typical enterprise nature of their networks (multiple facilities with multiple business operations needing data communications).

to pivot to working, learning and taking good care of their health in what became a virtual world.

This has led to a substantial focus at the Federal, State and local levels, not only on expanding and enhancing broadband availability, but also on expanding and enhancing equitable access to broadband and the Internet. This includes Federal and State designation of "Covered Populations"⁴ who are those most likely to have challenges participating in a digital society and thus those that suffer most from digital inequity. Beginning with the Federal CARES (Coronavirus Aid, Relief and Economic Security) Act, and continuing with ARPA (American Rescue Plan Act), and BEAD (Broadband Equity, Access and Deployment), responsive measures and funding have been provided to help promote digital equity and raise digital inclusion of these Covered Populations.

• Funding Availability -- As noted above, and in the Plan Update information that follows, at both the Federal and State levels, substantial funding, including funding designated to be utilized for deployment and adoption-spurring activities in Lake County, has been provided and will continue to be provided into the foreseeable future to help expand and enhance broadband Internet access throughout the U.S., including in Lake County.

These are the underpinnings of the information that is provided herein, and the recommendations at the end of the 2023 Plan for initiatives, directions and actions to be incorporated in the Implementation Plan.

A. Background

Lake County continues to be classified as a rural county in Northern California with an estimated population as of July 1, 2022, of 68,191⁵ which is a slight rise in population from the date of the 2019 Master Broadband Plan. It encompasses 1,257 square miles in land area, with an additional 70 square miles encompassing Clear Lake.

The County area includes two incorporated cities, Lakeport and Clearlake, with Lakeport being the County seat. It also has numerous Census-Designated Places (CDPs) such as Kelseyville, Middletown, Upper Lake, Cobb and multiple others. By population, it is the 40th largest out of 58 counties in the State.

The County continues to have a wide variety of industries with the largest focused on agriculture, geothermal power and tourism. Specifically, according to the Lake County 2021 Crop Report,⁶ wine grapes were the number one crop, followed by pears. Walnuts,

⁶ See Lake County Annual Crop Report 2021 authored by the County of Lake, Department of Agriculture, Department of Weights and Measures, Katherine VanDerWall, Agricultural Commissioner.



⁴ Covered Populations, as defined by the NTIA and the State, include: individuals living in low-income households; aging individuals; formerly incarcerated individuals; veterans; individuals living with disabilities; English language learners; individuals with low levels of literacy; individuals who are members of racial or ethnic minorities; individuals who primarily reside in a rural area; children and youth; and individuals experiencing housing instability.

⁵ See United States Census Quick Facts, (V2022).

typically also a large crop, were impacted by a freeze event in 2020. Overall, Lake County's total agricultural gross production value was \$83,452,366, which was an increase of 11% in comparison to 2020. Certainly, the large amount of local winegrape growers in Lake County helps support a vibrant winemaking industry in the County.

Based on the presence of The Geysers, which is the world's largest geothermal field occupying approximately 30 square miles of Lake, Sonoma and Mendocino Counties, Calpine Corporation's Geysers Power Company, LLC also is a large part of the industrial landscape in Lake County. It has a synergistic relationship with the Lake County Sanitation District which provides recycled water to The Geysers in order to help provide a sustainable solution for reliable geothermal generation that benefits energy customers throughout California.⁷

Beyond this, Lake County's natural wonders and resources results in the County being a sought-after tourist destination, including for fishing and boating in Clear Lake, and hiking, bird watching and other naturalist activities, as well as scenic sightseeing, in the natural preservation areas throughout Lake County.

However, as in 2019 and accelerated by the impact of the COVID 19 pandemic, Lake County faces a number of challenges, including many that impact broadband Internet access availability and adoption, and are further impacted by the lack thereof. Specifically:

• **Terrain** -- Although the mountainous terrain of large portions of Lake County is beautiful and scenic, it creates substantial challenges for broadband deployment; most notably in the high cost of broadband construction and installation to pockets of residents throughout the County. For wireless broadband solutions, it creates topographical challenges, based on some technologies needing "line of sight" from transmission point to reception point in order to be both reliable and effective.

Clear Lake, while vast and beautiful in the center of the County (even helping spawn the County's name), also creates challenges for wireline deployment by extending the distances to get to individual residents and businesses from provider hubs and central distribution locations, because of having to go around the Lake.

• Environmental Factors -- Lake County has experienced devastating wildfires that have destroyed cable and other supporting infrastructure delivering broadband. In order to make such infrastructure more resilient, such as "hardening" the infrastructure, putting wireline cable underground, and employing other resiliency-supporting methods, the cost of initial deployment is substantially increased.

⁷ See <u>https://gogeothermal.geysers.com</u>





- High Concentration of Covered Populations -- As indicated above, the Covered Populations are those most susceptible to facing digital inequities and those most in need of digital inclusion support systems to boost adoption and maintain affordable, sustainable, informed use of broadband Internet access. Lake County has substantial numbers of those that fall into these categories, and this presents a more significant challenge to the County than in other locations in California. Such populations include, for example:
 - Household Income -- The median household income (in 2021 dollars) according to the 2017 to 2021 five-year ACS average⁸ was \$53,399. This continues to be substantially below \$84,097, the median household income for households throughout the State of California.⁹

Analysis further indicates that more than 1 in ten persons in Lake County live in poverty, at 16.5% of the population.¹⁰

- **Aging Individuals --** 23.9%, or nearly 1 in 4, of Lake County residents are 65 years and older.
- **Ethnicity and Language --** 24.7% of the population in Lake County is Hispanic or Latino, while 17.4% speak a language other than English at home.
- **Persons Living with Disabilities --** 13.5%, or more than 1 in 10, of the residents in Lake County are experiencing a disability.
- Education -- While the vast majority (86.6%) of Lake County residents aged 25 and older are high school graduates, only 17.5% have a Bachelor's degree or higher, well below the California statewide amount at 35.3%.

¹⁰ See United States Census Bureau, Quick Facts for Lake County, California, Income & Poverty.



⁸ See United States Census Bureau, Quick Facts for Lake County, California, Income & Poverty.

⁹ See United States Census Bureau, Quick Facts for California (2017-2021).

III. BROADBAND AVAILABILITY IN LAKE COUNTY

A. Broadband Definitions

Terms introduced in this Section of the 2023 Plan and used throughout the 2023 Plan include:

Broadband - The term "broadband" refers to high speed Internet connectivity to one or more physical locations. Although somewhat confusing, there are multiple definitions for what makes Internet access broadband rather than just fast Internet. broadband definitions have changed over the years and currently, the Federal Communications Commission (FCC) defines broadband as 25 Megabits per second (Mbps) from the provider to the end user, also referred to as the download direction. The connection must also provide connectivity from the end user to the provider of at least 3 Mbps. This is often referred to as the upload speed. These speeds in an abbreviated format can be shown as 25 Mbps/3 Mbps. This method of showing connection speeds will be used throughout the 2023 Plan.

Although, 25 Mbps/3 Mbps was considered relatively fast when it was first adopted by the FCC in early 2015¹¹, up from 4 Mbps/1 Mbps as adopted in 2010, this speed has become more marginal in providing the functionality required by many, if not most, users of the Internet. Going forward, the FCC has indicated a desire to increase the minimum speeds required for a connection to be considered broadband. The next definition of *Broadband* from the FCC may be 100 Mbps/100 Mbps. This is more than sufficient for typical households of Internet users accessing a network at the same time. Of course, some users will require much higher speeds, and some don't need this level of service.

Broadband Serviceable Location (BSL)¹² – The FCC creates a map of all addresses or locations in the United States that could be physically served by a broadband ISP or provider. These locations are referred to as BSLs. It is important to note that the term BSL does not indicate whether a specific address is served but only that it exists and should likely be considered that the occupants would desire to have access to broadband.

Unserved and Underserved – These terms are used extensively throughout the Plan and may mean different things. A significant goal of this 2023 Plan, and follow-up tasks, plans and reports, is to identify where broadband network accessibility exists and

https://help.bdc.fcc.gov/hc/en-us/articles/16842264428059-About-the-Fabric-What-a-Broadband-Serviceable-Location-BSL-Is-and-Is-Not





¹¹ 2015 Broadband Report Progress Report, <u>https://www.fcc.gov/reports-research/reports/broadband-progress-reports/2015-broadband-progress-report</u>

¹² FCC's definition of BSL: A Broadband Serviceable Location (BSL) is "a business or residential location in the United States at which mass-market fixed broadband Internet access service is, or can be, installed. Residential BSLs include all residential structures, including structures that are (or contain) housing units or group quarters (as those terms are defined by the United States Census Bureau).

[•] Business BSLs include all non-residential (business, government, non-profit, etc.) structures that are on property without residential locations and that would be expected to demand mass-market, non-enterprise-grade Internet access service.

where it does not exist. A further differentiation is that of Unserved and Underserved. "Unserved" is defined as a BSL that cannot receive Internet service that is at or above 25 Mbps/3 Mbps¹³. Underserved is defined as a BSL that can receive broadband at or above 25 Mbps/3 Mbps but cannot receive speeds at or above 100 Mbps/20 Mbps.¹⁴

B. Current Broadband Landscape in Lake County

In this section of the 2023 Plan, the existing broadband environment or landscape in the County is explored and the existing options for broadband are explained where they exist.

A significant portion of a Broadband Study or Plan such as this is understanding the current availability of Internet and broadband throughout the County. CBG and its GIS Specialist team partner, were able to develop a broadband/Internet access availability inventory contained on a variety of different broadband availability map layers. The use of one or more map layers allows for detailed analysis of areas needing to be addressed related to broadband availability and adoption in the County. This review and analysis enabled CBG to identify where residential and business addresses exist that are not served by any broadband providers in the County (defined as "Unserved"¹⁵). Further, we have also created the ability, on our Project-specific maps, to see where non-broadband Internet is available; however, broadband speeds are not provided (defined as "Underserved"¹⁶). The various provider map layers are described and shown below and provided via the Interactive Map¹⁷T further explained below.

We began the process of identifying broadband availability by holding an initial discussion with the County to refine the deliverables for the Project. CBG developed a County specific interactive map as a base for importing broadband-related data into the map in layers that can be turned on or off to facilitate analysis of broadband in the County, such as where broadband exists, as offered by one or more providers, and where it is not available from any providers. In addition, these map layers showing availability of broadband, are utilized to aid in determining where other factors, such as demographic-based digital equity issues, may be responsible for low adoption rates among specific demographic groups. These adoption issues are further explored and explained in other portions of this Updated Plan.



¹³ An unserved location is defined as a broadband-serviceable location that the Broadband DATA Maps show as (a) having no access to broadband service, or (b) lacking access to <u>reliable broadband service</u> offered with - (i) a speed of not less than 25 Mbps for downloads; and (ii) a speed of not less than 3 Mbps for uploads [25/3 Mbps]; and (iii) latency less than or equal to 100 milliseconds.

¹⁴ An underserved location is defined as a broadband-serviceable location that is (a) not an unserved location, and (b) that the Broadband DATA Maps show as lacking access to <u>reliable broadband service</u> offered with - (i) a speed of not less than 100 Mbps for downloads; and (ii) a speed of not less than 20 Mbps for uploads [100/20 Mbps]; and (iii) latency less than or equal to 100 milliseconds.

¹⁵ See footnote #13

¹⁶ See footnote #14

¹⁷ Interactive Map:

CBG then imported various map layers from the California Public Utility Commission's (CPUC) interactive map, provided by the State to help facilitate broadband needs analysis and pursue deployment scenarios such as will be detailed in the followup to this Plan Update in the Lake County 2023 Broadband Implementation Plan (Implementation Plan). These map layers provide information on demographics within the County such as age, race, ethnicity, gender, marital status, income, education, and employment status. These map layers are largely being utilized in the study of adoption of broadband in the County and identifying the potential barriers that may need to be addressed. This is further explored and explained elsewhere in this 2023 Plan and will be further examined in the Implementation Plan.

An important note is that the CPUC's data tends to lag that of the FCC. Several available maps from the CPUC are dated 2021 and many are dated 2022. Taking the information shown on these maps and comparing it to the FCC's more current Broadband Map indicate that little has changed between 2021 and the most current data FCC maps dated December 31, 2022.

C. <u>Broadband Services Availability (Served, Underserved and Unserved</u> <u>Areas)</u>

Up until June 30, 2022, most publicly accessible information on where Internet access and broadband were available was reported at the Census Block level. This broadband availability data could be misleading due to an entire Census block being shown to have broadband availability, if as few as 1 address in the Block could connect to a provider's network that offered broadband speeds. These maps tended to show higher broadband availability than was actually present along the edges of towns and cities where density dropped down quickly.

The current FCC Broadband Map provides availability at the address level. Therefore, this more granular information allows for more accurate studies of broadband availability and where broadband is not available. This increased granularity allows more informed decisions to be made on how best to address equity issues based on lack of broadband availability.

The map below in Figure III.1 shows the significant lack of broadband in Lake County. The red areas are 100% unserved by broadband (wireline or wireless) with lighter blue colors indicating low availability of broadband.







Figure III.1. Map Showing the Percentage of BSLs That Have Broadband Available to Them.





Prior to showing specifics for each known Internet/broadband provider in the County, it is important to understand the two main categories of Internet and broadband providers: Wireline and Wireless infrastructure-based providers.

D. Wireline Broadband/Internet

The first category of physical assets is those categorized as wireline infrastructure. This can include fiber optic cables, twisted pair or copper phone wires and coaxial cables used in Hybrid Fiber Coaxial (HFC) cable TV networks.

1. Fiber to the Premises (FTTP)

Fiber optic cables running the entire path between the provider and the customers' premises has become the gold standard in network architecture. In a residential and small business environment, this is known as Fiber To The Premises (FTTP). Providers do, however, offer fiber optic-based service in a limited fashion to business and anchor customers in the County. Both AT&T and Mediacom provide fiber optic-based services to businesses and Anchor Institutions such as schools and government buildings throughout parts of the County.

However, to date, although fiber optic connectivity to single business facilities or to Community Anchor Institutions, offering symmetrical speeds at 1 Gbps and faster, are available, providers are currently not providing FTTP to residents. Generally, existing Lake County customers of these services must pay a much higher installation charge to bring the fiber directly to the facility and the monthly recurring charge is significantly higher than the costs paid for non-fiber based residential services.

2. Hybrid Fiber Coaxial (HFC) Broadband

Companies traditionally known as Cable TV companies have evolved their networks over the past couple of decades to provide Internet services and they have continued to increase their network capacity to include areas now served by broadband as it is defined today. HFC networks use fiber optic technology to get service to a neighborhood where coaxial cable is then utilized for the last section of the network feeding individual addresses.

These companies are completely reworking how the physical infrastructure is designed as well as making upgrades to the equipment used to activate the network up to and including the cable modem at customers' homes and businesses. These upgrades and redesigns will take time to fully deploy as it is a labor-intensive process.

At this point, though, of the Wireline providers in the County, Hybrid Fiber Coaxial (HFC) is the only infrastructure with a significant footprint in the County that provides consistent broadband speeds across the provider's entire footprint.





3. Digital Subscriber Line (DSL)

DSL provides non-broadband Internet service utilizing conventional telephone lines referred to as copper lines or twisted pair.

Copper phone lines can provide near broadband speeds close to central offices or close to a digital subscriber line access multiplexer (DSLAM) or node-like equipment located in the field. Copper based networks cannot effectively provide broadband speeds across a large footprint and therefore are most often not reported to provide speeds that would qualify as broadband.

DSL is provided sporadically in the County by AT&T. The FCC Broadband Map shows availability in a random fashion in the County, with speeds of 10 Mbps/1 Mbps and 0.2 Mbps/0.2 Mbps being the only available speeds. AT&T maintains its copper infrastructure for landline phone service but appears not to place a focus on DSL as a marketed Internet service.

E. Overall Wireline Broadband in Lake County

Of the wireline Internet providers identified during this Plan Update, only one provider offers broadband Internet service to more than a few addresses in the County. This is Mediacom California. The maps below show the coverage areas served by each of these providers and then the overall broadband coverage when they are all identified on the map.

F. Wireless Broadband/Internet

Wireless infrastructure can include a multitude of technologies from cellular networks to fixed-wireless networks and satellite-based services. For this Plan Update, we obtained mapping information from the FCC Broadband Map to show where cellular providers offer Licensed Fixed Wireless (static access that can be achieved with a permanently mounted or placed antenna versus while moving, such as cellular phones utilize). Fixed wireless systems operated by cellular providers are most often on the same network that provides mobile cellular connectivity. This network utilization uses a stationary antenna at the receive location rather than an antenna capable of mobile reception (such as that in cellular phones).

As shown on the maps below, there is considerable Unlicensed and Licensed Fixed Wireless Internet and broadband coverage in portions of the County. However, it is common for a Fixed Wireless provider to offer broadband speeds in some of its footprint or coverage area while not providing broadband speeds throughout its footprint. Further, Fixed Wireless networks are contention-based. This means that the active users share the total available capacity of a particular antenna/tower used to provide them with service. Thus, the number of active users and the level of capacity used for the applications they are running will impact the available speeds or capacity realized by all





users. In addition, obstacles such as buildings, signs, trees, etc. can impair the signal or completely block it from the user.

Fixed wireless networks tend to be more stable than cellular mobile networks as it relates to speed and reliability, because the users' antennas are fixed at or on a building in a predetermined optimal location.

G. Verifying Broadband Availability

One of the final steps to verifying broadband availability, shown on the map layers created and imported into the County map, was to perform spot-checks of areas throughout the County to see if reported services were indeed available. This process included identifying physical infrastructure such as fiber optic cables or coaxial cables in areas where service is reportedly available as shown on the FCC's Broadband Map or other map layers including the speed test layers.

Further, on the ground analysis provides a knowledge base when determining where broadband expansion is most beneficial to the communities as a whole. This knowledge becomes most valuable when the time comes to discuss potential designs and costs of expansion and what outside funding is required to create a successful business model that allows for such expansion.

During the course of developing this Plan Update, and other studies performed elsewhere, it was made clear by providers that they did not want their specific infrastructure shown on a public map. This is due to them believing that having their maps made public creates a competitive disadvantage. Additionally, security of a provider's assets is a critical concern and showing specific routes and locations could also be compromising by providing their network's most vulnerable locations to anyone with malicious intent. Therefore, we have focused on documenting, in a GIS mapping format, where each provider's services are available to residents and businesses, and we have documented available maximum speeds reported to the FCC in the download and upload directions.

To accomplish this, we have created polygons (areas outlined on the maps) to represent one or more addresses being defined as having, or not having, service from a specific provider. For instance, a polygon within the larger, more densely populated areas, such as the cities, can represent numerous individual addresses while a polygon in more rural, less dense areas of the County may only represent one or a few specific addresses. Overall, density increases closer to the population areas. This fact must be taken into account when looking at the maps below. Specifically, a polygon may be colored in, meaning the provider being reviewed has service available in the area represented by the polygon. However, as one drills down to look at the underlying data, it may be, and often is, that less than 100% of the addresses represented in that polygon are serviceable by that particular provider.





Often as a part of these studies, publicly owned (government-owned) networks are mapped as well. In the case of Lake County, much of the infrastructure utilized to interconnect the numerous Community Anchor Institutions (CAIs)¹⁸ is provided in a leased fashion from private broadband providers. Therefore, this Plan Update will provide speeds being utilized at each of the CAIs and whether 1 Gbps symmetrical speeds are available if the entity decides that is the required speed needed for specific locations, but actual infrastructure and its routing are not provided.

H. Broadband Types and Locations

As described above, this 2023 Plan shows availability of broadband at a coverage level in order to keep some infrastructure specifics confidential as required by many of the providers. Further, the FCC and its mapping contractor consider the base map of addresses to be confidential. Although we can view and utilize the FCC's address-based data, we cannot share it in this 2023 Plan. This more granular data can be viewed by the general public via the FCC's Broadband Map at:

https://broadbandmap.fcc.gov/home?version=dec2022.

Simply typing in an address will show the providers that serve that address, the technology each uses and the speeds they claim to provide.

With the above basis, the following map layers are provided:

I. Overall Wireline Deployment in Lake County

Lake County has limited availability of wireline based broadband. Generally, broadband is only available in the more dense areas around Clear Lake and then some population centers away from the Lake that have the density providers require to build out their networks. Wireline providers determine how many customers will be required to pay back their investment in infrastructure and to realize a profit over and above all anticipated expenses. The providers then apply a company standard formula to determine how many households and businsesses must exist for every mile of infrastructure needed to reach potential customers. The seemingly basic concept is why addresses in less dense areas may not have access to broadband

As shown in Figure III.4 on page 23, the purple areas are at or above broadband speeds and represent infrastructure owned and operated by Mediacom California. The remaining areas shown in greens and browns are owned by AT&T and the Internet service that is provided by them in these areas is not fast enough to meet the definitions for broadband.

¹⁸ Community Anchor Institutions (CAI), CPUC Definition: CAI data is composed of the names and locations of schools, colleges, libraries, healthcare institutions, social services institutions, other community institutions, and the broadband technology and capacity of these institutions.







Figure III.2. 2022 Wireless Deployment by Download Speed. Note That Served on this CPUC Map Includes Served and Underserved.





J. Reported Download Speed Availability by ISP

1. AT&T (Wireline DSL)

AT&T offers residential and business services in Lake County using DSL technologies. Figure III.3 shows speeds offered by AT&T (2021 CPUC Data). According to the CPUC, AT&T offers download speeds of 10 Mbps to 25 Mbps (light-green areas) throughout most of Lakeport, Nice, Clearlake, Upper Lake, Clearlake Oaks, Kelseyville, Cobb and Hidden Valley Lake. AT&T additionally serves North Lakeport with speeds that vary from 200 Kbps to 10 Mbps (brown, light-brown, and yellow areas). AT&T offers various download speeds of up to 25 Mbps in several unincorporated regions in the south and west of the County. However, based on the speeds shown on the latest FCC Broadband Map, neither the download nor the upload speeds meet the minimum broadband speeds of 25 Mbps/3 Mbps and we have found that AT&T does not offer broadband speeds over its Copper network in Lake County.



Figure III.3. AT&T Wireline Service (DSL Over Copper).





2. Mediacom California

Mediacom offers cable Internet service to residential and business customers using DOCSIS 3.1¹⁹. Figure III.4 shows speeds offered by Mediacom in Lake County (CPUC 2021 Data) of 1 Gbps to less than 2 Gbps download speeds (purple areas) in areas within and surrounding Clearlake, Lower Lake, Clearlake Oaks, Lucerne, Nice, Upper Lake, Lakeport, North Lakeport, Soda Bay, Kelseyville, Clearlake Riviera, Hidden Valley Lake, Middletown and a large area within and outside Cobb. Review of the FCC Broadband Map shows that download speeds of up-to 1 Gbps and upload speeds up-to 50 Mbps are provided by Mediacom in the County.



Figure III.4. Mediacom Wireline Service (DOCSIS over HFC).

¹⁹ DOCSIS (Data Over Cable Interface Specification). Telecommunications standard that enables data transfer over coaxial cable systems.



K. Overall Wireless Deployment in Lake County

Wireless based services are available in a much larger footprint in Lake County than that of wireline Internet and broadband shown above. However, many of the providers advertise speeds that are higher than what is actually widely available throughout a specific provider's footprint. Further, many of the wireless providers operating in the County are utilizing unlicensed spectrum. Use of unlicensed spectrum can be problematic because of potential interference from other providers.

Alternatively, when the FCC grants a license to a wireless provider, the license includes which frequencies that provider can use and where these frequencies can be deployed. The FCC ensures that other providers in the area cannot use these same frequencies which in turn ensures that nearby providers don't interfere with each others' transmissions.

The companies offering wireless Internet or broadband in the County are as follows:





1. Valley Internet

Valley Internet offers Internet service to residential and business customers. Figure III.5 shows speeds offered by Valley Internet in Lake County (CPUC 2021). Valley Internet provides speeds of 10 Mbps to less than 25 Mbps download speeds (light green areas) in western and southwestern portions of the County, including portions of Lakeport, North Lakeport, Clearlake, Clearlake Rivera, and surrounding areas. With speeds under 25 Mbps, these areas are considered unserved by FCC standards. Valley Internet also shows download speeds ranging from 6 Mbps to less than 25 Mbps (light-green and brown areas) in portions of Lucerne, Hidden Valley Lake, and Upper Lake. Valley Internet additionally offers business speeds of 100 Mbps to less than 500 Mbps download in an area outside Lakeport and business speeds of 25 Mbps to less than 100 Mbps download in Lucerne and other areas of the County.



Figure III.5. Valley Internet, Fixed Wireless.





2. Digital Path

Digital Path offers broadband service to residential and business customers through a terrestrial fixed wireless network. Figure III.6 shows speeds offered by Digital Path in Lake County (2021). Accurate coverage of fixed wireless providers is difficult to show on a map due to environmental factors such as trees, buildings and topography, which can affect availability and speeds, as well as reliability of fixed wireless service. The coverage shown in the map provided by the CPUC below represents the best efforts to visualize Digital Path's coverage. Based on the CPUC's Broadband Map, Digital Path offers download speeds of 10 Mbps to less than 50 Mbps (light-green and green areas) in portions of Clearlake, Clearlake Rivera, Clearlake Oaks, Soda Bay, North Lakeport, Lower Lake, Cobb, and throughout most of Lucerne and Spring Valley. Review of the latest FCC Broadband Map also indicates that speeds up to 50 Mbps download and up to 10 Mbps upload can be received from Digital Path in the County where service is available. Digital Path's salesperson stated that speeds of up to 400 Mbps/20 Mbps could be realized in areas around Clear Lake.



Figure III.6. Digital Path, Fixed Wireless.





3. North Coast Internet

North Coast Internet offers broadband service to business and residential customers in Lake County through an unlicensed terrestrial fixed wireless network. As discussed above, licensed wireless networks are protected from other operators interfering with the network as only one operator can use specific frequencies in the same area. However, unlicensed wireless networks can have reliability issues based on contention for the frequencies utilized to transport the data over the air. Anyone can utilize these frequencies without concern for how they may impact other unlicensed operators.

Figure III.7 shows broadband service speed provided by North Coast Internet of 25 Mbps to less than 50 Mbps download (green areas) in parts of Clearlake Riviera, Lakeport, North Lakeport, and in several unincorporated areas near Lakeport, Lower Lake, North Lakeport, and Kelseyville. However, review of the FCC Broadband Map only shows speeds up-to 25 Mbps/3 Mbps and North Coast's website advertises a top tier of 25 Mbps/3 Mbps.



Figure III.7. North Coast Internet, Fixed Wireless.





4. Lake County Broadband Solutions

Lake County Broadband Solutions offers broadband service to business and residential customers in Lake County using an unlicensed terrestrial fixed wireless network. As described above for North Coast Internet, unlicensed wireless networks can experience interference from other wireless users as the frequencies utilized are not protected from overuse.

Figure III.8 shows broadband service speeds provided by Lake County Broadband Solutions of 25 Mbps to less than 100 Mbps (green and light-green areas) in and around parts of Lucerne, North Lakeport, Clearlake Oaks, Kelseyville, Clearlake Rivera, Lakeport, North Lakeport and Hidden Valley Lake. Review of the FCC Broadband Map shows Lake County Broadband Solutions offers speeds of 80 Mbps symmetrical in much of its service footprint. Lake County Broadband Solutions also offers 100 to less than 1 Gbps (blue and light-blue areas) in a portion of Lucerne and areas south of Lakeport and north of Steinhart Lakes.



Figure III.8. Lake County Broadband Solutions, Fixed Wireless.





5. United States Cellular

United States Cellular offers cellular-based Internet service to business and residential customers in Lake County through a terrestrial licensed fixed wireless network under the name of Telephone & Data Systems. Figure III.9 shows non-broadband Internet speeds provided by United States Cellular of 1 Mbps to less than 3 Mbps (light-brown areas) in and around parts of Lucerne, Upper lake, Lakeport and North Lakeport, Soda Bay, Kelseyville, Nice, Clearlake Rivera, Clearlake Oaks, Clearlake, Lower Lake, Hidden Valley Lake, Harbin Springs, and Cobb. Review of the FCC Broadband Map show speeds of up-to 10 Mbps download and up-to 1 Mbps upload offered in portions of the County.



Figure III.9. United States Cellular, Fixed Wireless.





6. Starlink

Starlink is a Low Earth Orbit (LEO) constellation of Internet satellites. Rather than using one satellite in the manner which other Satellite Internet providers utilize, Starlink uses thousands of satellites that orbit the earth to provide service over large areas of the planet. Starlink has a high availability in the western half of the country while still deploying additional satellites to serve the eastern half. As advertised by Starlink, their service is available throughout Lake Country as long as a clear view of the sky is available.

Starlink reported to the FCC, as included on the FCC's Broadband Map dated June 20, 2022, that service levels of 100 Mbps/10 Mbps were available (consistent with prior years). However, the December 31, 2022, FCC Broadband Map shows Starlink offering service at only 50 Mbps /10 Mbps. As with many technologies utilized to provide public broadband, Starlink's system is contention based. This means that all customers actively using the same network satellites are sharing the available capacity. Although systems are designed to help overcome oversubscription problems that this may create, it means that speeds are slower as additional users access the network.

A significant downside to Starlink's service is its cost. The user equipment required at the customers' location costs \$599.00 (self-installation kit with equipment) plus \$50.00 for shipping and handling. Then, the monthly recurring charge (MRC) is \$120.00 per month, meaning the start-up cost and first month's service fee is in excess of \$800 when taxes are added.

Starlink has become an option, in recent years, for those locations far from other wireline and wireless networks' reach. An example of this is in the Pillsbury Lake/Gravely Airport area in the far north of Lake County. There are two Ookla speed test results showing download speeds of just above 100 Mbps and upload speeds of 6 Mbps and 7 Mbps. These are almost certainly Starlink customers as they are approximately 20 miles or more, in a straight line over the mountain range, from any other provider.







Figure III.11. Starlink's Reported Coverage Areas (Blue Polygons) in Lake County.





7. Other Satellite Based Providers

In addition to Starlink, there are other satellite based wireless Internet/broadband providers that offer service throughout Lake County. Hughes Network Systems, ViaSat (also purchased WildBlue Internet in 2009) and others provide varying levels of service catering to rural areas where wireline services are not available. Generally, anywhere with a clear view of the Sky is a potential service location for satellite-based services. Because of this, we have not mapped satellite-based service, other than Starlink, for this 2023 Plan.

L. Speed Test Data Map Layers

Numerous Internet speed testing sites exist today. These sites allow Internet users to test the speed of their connection at any time to determine if the system is functioning properly and to analyze the realized speeds at a particular address. Speed tests must be reviewed with the understanding that variables exist in the testing environments that impact the results of the tests. For instance, if an address is connected to a 1 Gbps symmetrical service, but the wireless modem only transmits 500 Mbps, the speed test results will show something far less than 1 Gbps. This single test does not prove that the provider is only providing 500 Mbps; rather, the customer is realizing the lower speed based on the customer premise equipment (CPE) utilized.

In addition, the number of devices connected to, and using, the Internet connection will decrease the realized speeds at the device being utilized for the speed test. Another significant consideration is the level of service being subscribed to. For instance, consider where the provider is offering its 1 Gbps symmetrical service to an address. However, the resident only subscribes to a lower-level service such as 100 Mbps/50 Mbps. This results in speed test results of less than 10% of the advertised speeds. Although the actual available speeds are likely lower than advertised, these demonstrated results will provide an inaccurate evaluation if only viewed and analyzed as a single test and not viewed in conjunction with several other tests in the area.

1. Speed Test Maps

In Figures III.12 & III.13 and the map legend in Figure III.14 below, the red boxes of addresses represent speeds below 100 Mbps/20 Mbps within that box. Additionally, the boxes that are gray have average speeds above 100 Mbps/20 Mbps. Due to the variables explained above, this somewhat high-level information allows for only a general understanding of the level of service being realized in each box.

As with other map layers, the Interactive map allows the user to drill down to specific areas to retrieve and analyze more granular data. The map further below in Figure III.15 is the same as the map above it in Figure III.13 but the view is zoomed in or drilled down into a smaller geographic area. In this example, this allows the user to see a better representation of measured speeds in an area in the Kelseyville area. Results





for the highlighted box are shown on the upper right portion of the map as results averages for 49 separate tests that were taken.



Figure III.12. Ookla Speed Tests and CPUC CalSPEED Crowdsource - Fixed Test Results – (Northern Section of Lake County).







Figure III.13. Ookla Speed Tests and CPUC CalSPEED Crowdsource - Fixed Test Results – (Southern Section of Lake County).







Figure III.14. Ookla Speed Tests and CPUC CalSPEED Legend






Figure III.15. More Granular View of Ookla Map Layer – Near Kelseyville.





The Microsoft speed test results are shown in a high-level fashion in the below map. Drilling down on this map layer does not provide the more granular data as described for the Ookla Speed Tests and CPUC CalSPEED maps above, as it is compiled by Microsoft at the Zip Code level. Microsoft compiles data during users' visits to Microsoft websites for purchases, research and scheduled updates to operating systems and software. Microsoft states, "Every time a device receives an update or connects to a Microsoft service, we can estimate the throughput speed of a machine. We know the size of the package sent to the computer, and we know the total time of the download. We also determine zip code level location data via reverse IP."

The Microsoft speed test map, Figure III.16, provides less value, as granular data cannot be analyzed, but the map does provide an additional layer of verification of overall available, or lack of available broadband speeds in each Zip Code.



Figure III.16. Microsoft Speed Test Layer.





M. Unserved Areas of Lake County

Once the above-described broadband service areas were plotted on map layers, analysis began of where broadband, both regarding those classified as fully Served and those classified as Underserved, is available and where it is not. This is known as a gap analysis as gaps are identified in order to later determine areas where deployment will be needed in order for an area to be considered Served going forward.

The entire Lake County area was overlayed with hexagons of addresses from the FCC's BSL list. Each hexagon represents a geographic area with varying numbers of BSLs, with as few as one BSL up to 575 in Clearlake Oaks.

Each hexagon on the County map was then evaluated to determine the percentage of addresses within the hexagon that are served with broadband. This particular classification does not identify providers, speed levels or other specifics. It merely shows the level of availability of broadband speeds via all providers.

The first broadband map, Figure III.17 below, shows areas where broadband is not available at all. The red hexagons indicate that no address within that hexagon can receive broadband service from any provider. Note that this particular map does not specifically show where broadband is available, but merely where it is not available.







Figure III.17. Hexagons With Zero Availability of Broadband.





The second broadband map, Figure III.18 below, shows areas, red hexagons, where broadband is not available at all (0% Served), but also includes hexagons in shades of blue, showing the percentage of addresses or BSLs within the hexagon that do have access to broadband.



Figure III.18. Hexagons With Zero Availability in Red and Percentages of BSLs with Access to Broadband





Figure III.19 below shows the same map layer as Figure III.18. However, we have drilled down to a specific hexagon to show information for the area included in the hexagon. In this example, near Park Way and Hill Road E, the highlighted hexagon shows that there are 48 BSLs within the hexagon. Of these 48 BSLs, 27 are served by cable (HFC) which is labeled as broadband, 19 BSLs are Underserved and 2 are Unserved.



Figure III.19. Details are Shown in the Upper Right Corner for the Highlighted Hexagon.

Once all of the hexagons are labeled with an availability designation, the roll-up provides both a quick view of the entire County for large areas, where broadband is available to less than 100% (everywhere not shown as the darkest blue color) of addresses as shown in Figure III.19 above, and by drilling down, specific neighborhood level areas can be evaluated for the level of need for broadband.





Further, although the map shows color coded hexagons based on served versus unserved addresses, once a drill down is performed, the map shows the total number of addresses in the hexagon or "Broadband Serviceable Locations" (BSLs) as well as the total number of unserved addresses and the total number of underserved addresses in the hexagon. As an example, this is also shown in Figure III.19 above.

An additional map layer that aids in the analysis of unserved and underserved areas of the County is shown in Figures III.21 and III.22 with a corresponding legend shown in Figure III.20 below. This map layer identifies hexagons that contain unserved and underserved addresses in the County and provides further value by bringing the number of BSLs within the hexagon that are un/underserved into consideration with a color coding as shown in Figure III.20. This layer allows identification of areas of the County with higher densities of un/underserved BSLs to be evaluated for broadband expansion in order to potentially serve more addresses with limited available funding.

1 Unserved BSL	10-20 Unserved BSL		
Unserved BSLs	Unserved BSLs		
> 20 - 251	> 20 - 251		
> 10 - 20	> 10 - 20		
> 1 - 10	> 1 - 10		
> 0 - 1	>0-1		
0 - 0	0-0		
1-10 Unserved BSL	20+ Unserved BSL		
Unserved BSLs	Unserved BSLs		
> 20 - 251	> 20 - 251		
> 10 - 20	> 10 - 20		
> 1 - 10	> 1 - 10		
>0-1	>0-1		
0-0	0.0		

Figure III.20. Legend for Unserved Hexagons with Numbers of Unserved Addresses







Figure III.21. Hexagons with Numbers of Unserved Addresses Identified by Color Coding.





Figures III.22 and III.23 show a drill down to 2 separate specific hexagons. In Figure III.22, the hexagon shows only one unserved BSL within the hexagon. Depending on data provided for nearby hexagons, this may be determined to be a lower priority when the County and providers prioritize areas to focus on for potentially deploying broadband.

An additional benefit of this map layer is the identification of areas which are several miles from broadband service. Although still important, if these areas only contain a small number of un/underserved BSLs, the significant financial expenditure needed to reach these areas by <u>wireline</u> system expansion (such as FTTP) may not be practical as a part of the current broadband deployment funding environment. These funds may be better focused initially on areas of higher un/underserved density.



Figure III.22. Highlighted Hexagon, Identified by Color, Only Includes 1 Unserved Address.





Figure III.23 below shows a hexagon, which is initially identified by the color red to have between 20 and 251 BSLs that are unserved or underserved. A drilldown then identifies that a total of 76 BSLs in this hexagon are unserved. This hexagon, combined with the neighboring hexagons indicates this area has a high level of need and should be a focus of the County and providers for broadband expansion.



Figure III.23. Highlighted Hexagon Shows 76 Unserved BSLs in Drilled Down View





N. Identification of Specific Gap Areas

With all of the above tools and map layers available, we began the process of identifying specific areas of focus for analyzing and then prioritizing gaps throughout the County. We worked with the County to identify gaps, including discussions concerning some of the larger areas that appeared to be unserved or underserved. These areas were then more finitely evaluated using the above-described map layers to determine which BSLs are underserved or unserved in each of the areas. The areas deemed to have issues with broadband availability, were then plotted onto a new map layer that can be overlayed on top of any of the map layers described above.

These areas are shown below:



Figure III.24. 15 Specific Areas Countywide Identified for Additional Review and Potential Broadband Deployment Discussions with Providers.







Figure III.25. Potential Project Area Near Upper Lake Rancheria With 100 Unserved BSLs.







Figure III.26. 3 Potential Project Areas Around Kelseyville Totaling Approximately 598 Unserved or Underserved BSLs.







Figure III.27. Potential Project Area In and Near Spring Valley With Approximately 506 Unserved or Underserved BSLs.







Figure III.28. 3 Potential Project Areas In and Near Glenview and Loch Lomond With Approximately 292 Unserved or Underserved BSLs.







Figure III.29. 3 Potential Project Areas In and Near Castle Rock Springs, Harbor Springs and South to the Border with Napa County. These Areas Combined have Approximately 297 Unserved or Underserved BSLs.







Figure III.30. 4 Potential Project Areas Around the Southern Shores of Clear Lake and in the Lower Lake Area. These Areas Combined have Approximately 265 Unserved or Underserved BSLs.

The 15 Potential project areas are not in any particular order of priority and the groupings were developed for initial analysis purposes. Each of these areas will need to be reviewed further in order to determine the level of infrastructure needed in order to get broadband into the area and then the amount of infrastructure and corresponding costs to provide service to the BSLs in the area.

Following these above processes, costs must be allocated on a per BSL basis to determine the average cost of providing service to the unserved and underserved BSLs in the Area. The cost per BSL is then compared to the providers' maximum cost per passing as required by their Return on Investment (ROI) models. If the average cost per BSL passed with new infrastructure would be higher than the provider's ROI allows, the





difference would need to come from additional sources such as that available through various current and upcoming Federal and State grants.

A full deployment analysis for these areas will be developed as part of the followon Implementation Plan.

O. <u>Evaluation of Broadband Gaps Must Include Analysis of Numerous Map</u> <u>Layers</u>

When evaluating areas for potential broadband expansion, caution must also be taken to fully understand the parameters being shown on the map. For instance, at a given address, the minimum level of service that must be met is above 25 Mbps/3 Mbps to be considered at least "underserved", while levels of above 100 Mbps/20 Mbps must be made available by one or more providers to be considered fully served.

Looking at single types of map layers of served/unserved status can be misleading as parameters such as the availability of nearby broadband infrastructure, or lack thereof, can have a significant impact on the viability of deployment by existing or new providers that could potentially serve the area. In addition, if availability maps are viewed at a high level only, details that may have a significant impact on determining viability may not be seen. These are only seen as a drill down is performed to show very granular information.

P. <u>Rural County Representatives of California/Golden State Connect Authority</u> <u>and Other Potential Federal Funding Account-Financed Projects</u>

The Lake County area has been allocated approximately \$28 million from the Federal Funding Account (FFA) Program designed to expand broadband availability into currently unserved/underserved areas of the County. Two separate potential projects are being evaluated by the County with an outcome potentially including the County supporting portions of both projects.

One of these is being proposed by the Rural County Representatives of California (RCRC)²⁰. The RCRC is comprised of 40 rural Counties. The RCRC is an advocate on behalf of its members for all matters impacting rural Californians. The Golden State Connect Authority (GSCA)²¹ is managed by the RCRC's staff with the purpose of "increasing access to Quality Internet for Rural California".

The RCRC/GSCA received a Local Agency Technical Assistance (LATA) grant on behalf of Lake County and other rural counties in January 2023²². As part of this grant, RCRC/GSCA have undertaken a project to design Open Access Network (OAN) connectivity into rural areas of the State, including in Lake County. One potential FFA funded project could be based on work performed to date under this grant.

²² https://www.rcrcnet.org/rcrc-affiliate-entities-6





²⁰ <u>https://www.rcrcnet.org/about-rcrc</u>

²¹ https://goldenstateconnect.org/

The County has also worked with Mediacom to discuss and create conceptual designs for expansion of Mediacom's network in the County. This expansion would provide Middle Mile and Last Mile network infrastructure into currently unserved and underserved portions of the County.

Details are being considered and reviewed by the County and the potential partners at this time for the potential projects. FFA grant applications are due by September 29, 2023.

Q. CASF Infrastructure Account Proposed Projects in Lake County

The CPUC has made public 73 applications for funds from the California Advanced Services Fund (CASF), including 4 in Lake County. These funds are made available for network deployment in areas that are unserved or underserved by broadband as described in the State's "Frequently Asked Questions (FAQs) California Interactive Broadband Map"²³:

The CASF Infrastructure Account Eligibility layer shows residential broadband serviceable locations unserved at broadband speeds equal to or greater than 25 Megabits per second (Mbps) download and 3 Mbps upload. These locations are considered either "Eligible" or "Priority Eligible."

- a) "Eligible" unserved locations only have access to broadband at speeds between 10 Mbps download and 1 Mbps upload and 25 Mbps download and 3 Mbps upload.
- b) "Priority Eligible" unserved locations only have access to speeds less than 10 Mbps download and 1 Mbps upload or no access to broadband at all.

There are 2 providers in the County that applied for CASF funds. Digital Path, as shown in Figure III.32 below, has proposed feeding pockets of homes around the northern half of Clear Lake down to Buckingham Park and south to just north of Clear Lake Riviera. The proposed coverage area will also include areas from Soda Bay and south to Kelseyville and the Highland Springs area.

²³<u>https://www.broadbandmap.ca.gov/documents/FAQ%202023%20Broadband%20Map%20and%20CASF%20Eligibil</u> <u>ity%20Layer.pdf</u>







Figure III.32. Digital Path's Proposed Expansion Areas (Purple Polygons).





The second provider having applied for CASF funding is North Coast Networks (NCN). NCN has applied for funding of 3 separate project areas that combined, largely circle Clear Lake.

These providers have applied for funding to serve areas that overlap with each other. Because the grants are competitive for the area intended to be served, the CPUC will have to make determinations as to whether and which of these areas are funded for each provider. Although there is an overlap of coverage areas, these 2 providers' proposed footprints are not identical. Therefore, some homes that would be served by one of the providers would not be served by the other.

NCN's proposed coverage areas are shown in Figures III.33 to III.35 below.







Figure III.33. North Coast Networks Proposed Expansion Areas (Purple Polygons).







Figure III.34. North Coast Networks Proposed Expansion Areas (Purple Polygons).







Figure III.35. North Coast Networks Proposed Expansion Areas (Purple Polygons).





R. Community Anchor Institutions

In addition to the residential and business addresses being evaluated for broadband service availability, Community Anchor Institutions (CAI) were evaluated for the level of broadband each institution could receive from a private provider or as a facility connected to a government sponsored network.

The broadband goal or requirement is that every CAI has the <u>availability</u> of 1 Gbps symmetrical service as a baseline. To determine this, CBG began the process of querying information from each entity for every facility known to be operated as a CAI. The information needed for the Plan Update was the name, address, broadband provider serving the location, advertised and realized download and upload speeds,

We have worked with the County and allied entities through discussions and emails to identify known CAI entities and to gather the above-described information. We have included all School and County facilities and services known, to date, that are classified as CAIs for the purposes of this Plan Update.

A determination is being made as to how to gather information from more CAI entities for each specific facility which each entity manages. We will then analyze the final list of facilities for an overall understanding of where shortfalls exist and how best to address them in the Implementation Plan. A list of responses to date is included in Appendix A of this Plan Update.

S. <u>Middle Mile Service Availability</u>

In networking terminology, there is Last Mile infrastructure and Middle Mile Infrastructure.

With the superior performance of fiber optic cables and the relatively similar cost to deploy or construct fiber optic vs. coaxial cable or twisted pair, almost all new deployments of both Middle Mile and Last Mile infrastructure are done with fiber optic cables. In addition, providers are replacing aged copper and coaxial cables with fiber optic cables for the Last Mile to realize the increased performance and reliability of fiber optic-based infrastructure.

"Middle Mile" infrastructure is often defined as high capacity short or long-haul backbone infrastructure, as opposed to "Last Mile" infrastructure which is typically the specific laterals or distribution infrastructure to individual neighborhoods or homes. Middle Mile is currently often comprised of multiple strands of fiber optic cable and technologies like wavelength division multiplexing (much like adding additional channels, each capable of carrying similar payloads of data) which allow multiple services or providers to ride on a single fiber strand to conserve physical assets, including fiber optic cables, splices, space within splice enclosures, etc. In the past, Middle Mile was often high-capacity microwave communications, and even today, fixed wireless systems sometimes have wireless Middle Mile or backhaul.





Wireline networks can have one, or a combination of two infrastructures used for Last Mile. These can consist of fiber optic cable, coaxial cable and copper or twisted pair phone lines. Simply put, copper and coaxial cables have much shorter reach than fiber optic cables. This is why, in today's networks, they are only utilized to create connectivity between the Middle Mile fiber optic cables and the end users' residence or business. Last Mile networks comprised of copper or coaxial infrastructure, generally only have a reach measured in hundreds of feet up to a few thousand feet (both copper and coaxial cable can extend much further than this; however, performance drops off quickly with the added distance).

A simple way for a layperson to think of Middle Mile versus Last Mile is an analogy of freeways and city streets. The Middle Mile is the freeway with multiple lanes capable of facilitating very large capacities of all sizes of vehicles. These vehicles get off the freeway at specific offramps and use side streets to most efficiently get to a final destination. These side streets can be thought of as Last Mile, which typically have lower capacity, often only one lane in each direction, because the payloads needing to traverse these roads are fewer and smaller than those on the freeway.

Often times, in more rural areas, Middle Mile fiber doesn't exist close to where pockets of unserved and underserved BSLs exist. In these pockets, there may be enough BSLs in an area to justify, with or even without small levels of outside funding, the amount of Last Mile infrastructure that would be required to feed the area with broadband. However, because the nearest usable Middle Mile infrastructure is a significant distance away, this often-significant Middle Mile development cost creates a situation where companies cannot justify building the additional infrastructure required to serve the area.

Based on CBG's site visit to Lake County during the development of this Updated Plan, it was determined that AT&T has fiber optic Middle Mile infrastructure in many areas of the County. However, because AT&T considers provision of maps that would show the routing of this fiber to be confidential, it cannot yet be determined how any of this fiber optic infrastructure could be leveraged by any potential partners with AT&T. This fiber almost certainly creates what could be considered Middle Mile, but it is not known finitely where it is available.

Mediacom also has Middle Mile fiber in the County to provide service into neighborhood-sized areas where it then feeds into its Last Mile infrastructure.

The AT&T and Mediacom Middle Mile infrastructure though, are proprietary and are not Open Access Networks. OANs must allow any broadband provider to utilize the network under fair and equal terms with other providers utilizing the network.

With Middle Mile infrastructure being critically important for broadband deployment in rural areas of California, and the fact that Middle Mile infrastructure is seriously lacking





in these same rural areas, the State has designed a Middle Mile network as an OAN to address the following²⁴:

- 1. *"identify statewide open-access middle-mile broadband network locations that will enable last-mile service connections" and*
- 2. "in communities where there is no known middle-mile infrastructure that is open access" and
- 3. "with sufficient capacity" and
- 4. "at affordable rates"

As well as the prioritizations in Government Code Sections 11549.54(c)-(d):

- 1. "areas that can be built expeditiously"
- 2. "areas with no known middle-mile network access"
- 3. "regions underserved by middle-mile networks"
- 4. "regions without sufficient capacity to meet future middle-mile needs"
- 5. "locations that enable last-mile connections to residences unserved by 25 Mbps download and 3 Mbps upload"
- 6. "may also include entities that lack sufficient high-bandwidth connections, including, but not limited to anchor institutions, fairgrounds, and Tribal lands".

The State Middle Mile has undergone multiple design changes since the initial design was made public. The Middle Mile network was to have gone around Clear Lake on both the east and west sides of the Lake. However, more recently, the State has made cutbacks to the network with segments throughout the State being moved into a 2nd phase that currently has no timelines attached to it.

²⁴ Government Code Section 11549.54. <u>https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/communications-</u> division/documents/broadband-implementation-for-california/cpuc-middle-mile-analysis-transmittal-letter---3-15-22.pdf



As shown in Figure III.31 below, the State Middle Mile network is designed to come north out of Napa County on Highway 29 to Middletown. Then the network runs along Highway 175 to Highway 29 southeast of Kelseyville. The network then follows Highway 29 to Highway 20 in Upper Lake and then follows Highway 20 into Mendocino County. Additionally, there is a spur or spoke that runs from the intersection of Highways 20 and 29 in Upper Lake, along Highway 20 to Glenhaven where it terminates.



Figure III.31. The State's Middle Mile OAN, in Lake County, as it is Currently Designed





T. Current Advertised Services and Pricing

Internet Service Providers in the County, which serve more than a few isolated businesses, are shown in Table III.1 below. We researched the providers' websites for the offered, or advertised speeds and prices provided in the County as of the time of this Plan Update. It should be noted that there can be lower cost introductory rates, equipment purchases or rentals, installation fees and service call fees that can Impact the total actual costs for Internet service. These fees are not included in the Table on the following page.





Provider	Technology	Providers' Internet and Broadband Advertised Speeds				
		Download Speeds				
Mediacom California	100 Mbps	300 Mbps	1,000 Mbps			
	Cable Modem	Upload Speeds				
		10 Mbps	20 Mbps	50 Mbps		
		Advertised Prices				
		\$34.99	\$54.99	\$64.99		
		Download Speed				
AT&T	DSL	18 Mbps				
		Upload Speed				
		Not readily Advertised				
		Advertised Price				
		\$55.00				
North Coast Networks	Unlicensed Fixed Wireless	Download Speeds				
		4 Mbps	6 Mbps	15 Mbps	25 Mbps	
		Upload Speeds				
		0.5 Mbps	1 Mbps	2 Mbps	3 Mbps	
		Advertised Prices				
		\$49.99	\$69.99	\$139.99	\$199.99	
	Unlicensed Fixed Wireless	Download Speeds				
		20 Mbps	30 Mbps	50 Mbps		
Lake County		Upload Speeds				
Broadband Solutions		20 Mbps	30 Mbps	50 Mbps		
		Advertised Prices				
		\$67.00	\$79.00	\$99.00		
Digital Path	Unlicensed Fixed Wireless	Download Speed				
		400 Mbps				
		Upload Speed				
		20 Mbps				
		Advertised Price		-	-	
		\$109.99				
Valley Internet	Unlicensed Fixed Wireless	Download Speeds		-		
		50 Mbps	75 Mbps	100 Mbps		
		Upload Speeds				
		10 Mbps	15 Mbps	20 Mbps		
		Advertised Prices		-		
		\$96.00	\$154.00	\$194.00		

 Table III.1. Internet Service Provider Advertised Speeds and Costs.





IV. <u>SECTOR ANALYSIS - BROADBAND DRIVERS, DEMAND AND</u> <u>ADOPTION</u>

The following Sections explore the overall impact of broadband Internet access (or lack thereof) on key sectors and their associated stakeholders in Lake County.

A. Business and Economic Development

In today's global economy, and as pointed up starkly during the COVID-19 pandemic, nearly every form of commerce depends greatly on affordable, reliable, high-capacity Internet access, which is facilitated by broadband. This includes, but is not limited to, everything from large business enterprise networks that are the backbone of multiple types of internal and external applications, down to the continual business transactions of small retail and home businesses with an increasing focus on cloud-based applications (in other words, both the application itself and the work products are stored in the "cloud" on distributed remote server farms). In all cases, high-capacity upload and download capability is critical to a wide variety of work functions.

It is also important that broadband be available as uniformly as feasible throughout an area, because of the portability and mobility requirements of many types of businesses. In other words, a high-capacity connection at a central location is not enough to enable a constant flow of necessary information. Such connections must also be available at multiple locations in the community in order for a business to be sustainable and thrive. This is evidenced by the large number of portable devices (such as laptops, tablets, smart phones and other portable computing devices) utilized that can access high-capacity applications at high speeds, if such speeds are available.

Information received through interviews, focused discussions and surveys of business and economic development interests in Lake County show broadband-related needs that are consistent with those around the country and around the world. As examples:

1. Interviews, Focused Discussions and Business Broadband Survey

In order to best understand the current challenges faced by the businesses and economic interests in Lake County concerning access to and utilization of broadband and Internet, an interview was held with the Lake County Economic Development Corporation (EDC) Executive Director, and a focused discussion was conducted with the Lake County EDC Board. Thereafter, the EDC and its clients, members and allied entities helped promote a Business Broadband Survey with their constituencies, and a summary of the responses was developed. The following are the key findings from the interviews and focused discussions, and from the completed Survey responses.





• Lake County has seen a shift to a remote working environment, which is directly impacted by broadband and Internet access availability -- Even before the pandemic, and certainly as a result of the pandemic, participants in the discussions noted that the number of remote workers and the amount of time spent remote working has increased substantially in Lake County. This was described as business owners and staff working from home (WFH) as well as entrepreneurs based locally, but with their staff telecommuting from a distant location. Remote work requires reliable connections, and can require substantial connection capacity, both of which were noted as a problem in many portions of Lake County.

Remote work requires that virtual meeting applications like Zoom be continuously available uniformly throughout an area where a person is working, whether through wireline connections at remote offices and other locations, or through wireless connections such as mobile cellular broadband so that people can participate in the midst of traveling. Areas mentioned as problematic regarding lack of connectivity, for example, include areas around Upper Lake, Scotts Valley Road, areas along Highway 20, areas around Middletown and Cobb, the Finley area and others more specifically described in other Sections of this Updated Plan.

• Not having reliable connectivity creates issues with efficient and effective productivity -- When online access is critical, and it's either not available, or not reliable, participants reported that businesses have to develop workarounds. However, the workarounds themselves are not always dependable. This creates additional time needed to perform critical functions, delays in providing services or completing work products, and other related problems.

Participants indicated that this lack of reliable online access also creates the perception that businesses shouldn't pursue a high degree of online commerce or engage in activities that require continuous reliable connectivity, because such connectivity is not dependable enough to base business services on. In other words, participants note that businesses question whether they should make the investment in online services, which could drive more commerce, higher revenues, more clients and support business expansion, if all the hard work does not achieve success because reliable connections are not available.

These perceptions were then described as negatively impacting the adoption of what should be beneficial technology.

• Some adoption issues in the business community are related to generational and cultural issues -- Some businesses were described as relying on, and being more comfortable with, traditional means of doing business, including primarily cash transactions or doing recordkeeping by hand. Accordingly, even with reliable, affordable Internet access and





appropriate devices to connect and use Internet access, it may not be adopted. In this case, it becomes a training and educational issue in order for businesses rooted in older generations and traditional work activities to see the benefits of, and place a higher value on, such access and utilization.

In Lake County, as in many rural counties, affordability is a substantial problem in obtaining necessary broadband availability and access -- It was noted in discussions that even slow speed, semi-reliable Internet access was substantially more expensive (and thus significantly impacts a business's bottom line) than it would be in more dense, urban environments. As an example, one business making a highly necessary shift to fiber to the premises (FTTP) connections from DSL saw a price of \$550 a month for voice and Internet services, with a symmetrical speed of 10 Mbps/10 Mbps. In urban markets, such FTTP access for 10 times that speed in both the download and upload direction would be 1/5 the cost.

The business noted that once the base amount was paid, it was another \$50 per 10 Mbps, which allowed some of the business locations to move to 20/20, but it was too high of a cost for all locations, based on a price/benefit comparison.

These findings demonstrate the kind of difficult decisions that businesses in Lake County, even moving to more reliable FTTP access, must make because of the substantial cost.

- There will need to be various broadband technology solutions in order to serve the business-related needs of Lake County businesses and workers -- For those that either have remotely located businesses or are remote tele-workers for larger enterprise businesses (and in both cases need high-capacity broadband communications), participants reported that businesses need to have both wireline and wireless solutions in order to meet the need. An example was given of a programmer for Google who needed a high-capacity connection in order to work remotely that a fiber to the premise connection could easily enable, but based on the distance of his home from the closest point of fiber availability, the installation cost alone for FTTP was \$164,000. What ultimately occurred was a high-capacity wireless broadband connection from Lake County Broadband Solutions which, once the right aggregation point was provisioned, was able to be installed for 1/20 of that cost. Many such instances may need to be looked at on a case-by-case basis.
- For some businesses, in order to adequately provide services to lowincome clients, there will need to be broadband cost subsidies -- It was discussed that one of the challenges, even when a business had adequate broadband capacity and access to the Internet, is that their clients are not able to afford the cost of the high-capacity service, even when it is available to them. This points up the continued need of programs like the Federal Affordable





Connectivity Program (ACP) in order to be able to afford those connections and receive the services that businesses can provide.

This is demonstrated in the receipt of other critical services such as health services, social services, education and training, and other critical needs as well, discussed later in this Section.

2. <u>Summary of Broadband Business Survey Results</u>

In conjunction with the County and the Lake County EDC, an online survey was distributed to and through 39 client and partner organizations. A diverse response was received, mainly from small businesses, and a summary of the findings and related observations is provided below:

- **Type of Business** -- Respondents represented 11 different NAISC classifications including everything from Food Services; Healthcare and Social Assistance; and Agriculture, Forestry, Hunting and Fishing; to Arts, Entertainment and Recreation; Professional, Scientific and Technical Services; Real Estate and Rental and Leasing, Retail Trade and others. Some of the others included a community nonprofit broadcast radio station and a glass tinter window filmer.
- **Respondent Title** -- The majority of respondents had either ownership or senior level management responsibility, including Owners, Owners/Operators, Executive Directors, General Managers, Managers, Consultants and a Technical Volunteer.
- **Size of Business** -- Most of the businesses were indicated by the respondent representatives as micro (less than 10 people), with additional small, medium and large-size businesses, thereby providing a good qualitative picture of broadband-related characteristics of the operations of especially smaller businesses in Lake County.
- Location of the Business -- The respondent businesses were located in 8 different zip codes throughout Lake County, with the largest number in the zip code 95453 in and around Lakeport.
- Broadband Technology Utilized at Their Business -- For this question, respondents were asked to provide all the connections that they use at their business location. The majority of respondents have a current wireline broadband (cable or fiber) connection (72%). This was followed by 24% that had a cellular/mobile broadband connection, 16% that utilized a mobile hot spot, an additional 16% that utilized fixed wireless, 8% that had a satellite connection and 12% with a DSL connection. One respondent indicated Internet service wasn't available at their location, and another respondent indicated that they had not established Internet connection at their business location.





- Access to Broadband Service -- Regardless of the technology that was being utilized, respondents were asked if they had broadband speeds at their location (at least 25 Mbps download/3 Mbps upload). The majority indicated that they did, followed by many that weren't sure of their speeds and 13% that indicated that they did not. This 13% indicated several reasons why they did not have broadband service. The number one answer was that it wasn't available in their area, followed by "the provider I want is not in my area" and that the return on investment wasn't there for the added cost. In this particular case, they had a fiber connection but only were accessing a 10 Mbps symmetrical service. They further indicated that they had had reliability issues with other providers.
- The Ability of Their Broadband Service to Meet Their Current Needs --Over 60% of respondents indicated that their current needs are not being met by their current services. The number one response as to why their current service was not meeting their needs, was that the service is "too slow". This was followed equally by "too expensive" and "unreliable". Many respondents also indicated that only one provider was available in their area, and they'd like to have a choice.

The next largest category was "Other" where respondents indicated that the Internet was not fast enough and robust enough for their business and their guests (this was a hotelier responding). Others were having issues with multiple computers and users to be online successfully simultaneously. Additional respondents indicated they had service problems both at their business and at home.

- **Top Five Uses of Broadband Internet** -- Myriad uses were provided by responding businesses related to their use of the Internet. Many were transactional-based such as payment processing, access to online accounts, billing and procurement activities. Many types of research activities were listed, as well as social media, access to cloud-based applications, all sorts of content streaming, email and other communications, virtual meetings and workshops, access to reports and many other types of applications; quite simply, nearly every internal and external communication application that's necessary to support business.
- Internet/Broadband Devices, Technologies and Applications Utilized ---Respondents were asked what Internet/broadband devices, technologies and applications were used by staff, used to provide services and are needed but they don't have access to.

The number one device **utilized by staff** was smart phones/mobile phones followed by desktop computers, remote access to work applications and then laptops and tablets.





The *least utilized*, at just under half, was 5G Internet/wireless Internet, which was *also the technology that was most needed*, but the business didn't have access to, at 1/3 of respondents.

The number one technology **used to provide services** was desktops/computers followed by high-speed Internet/broadband (for those that have it) and then by tablets and other technologies. 5G Internet/wireless Internet is used by less than half of respondents to provide services, again because many don't have access to it.

Besides access to 5G Internet, the next technology needed but not accessible was high-speed Internet/broadband by nearly 17% of respondents. One respondent indicated "Other" and explained that they needed faster download and upload capacity because they need to access critical programs online, but oftentimes their current connection dropped during uploads, so the cloud connection had to be re-established and the upload started over, thus creating substantial problems in efficiency.

- Other Devices or Applications the Business Needs -- About 1/3 of respondents indicated that there were other devices that were needed, which primarily focused on: hot spots to use when the Internet was down or there was no Internet; equipment to provide WiFi; and devices to enable more efficient operations such as handheld ordering devices.
- **Training of Staff** -- The overwhelming majority of respondents indicated that their staff were trained to use the Internet effectively, so education and training at their businesses was not an issue. One indicated that "a change of attitude" was needed to prepare their workforce to utilize the Internet to the business's maximum benefit. This potentially indicates reluctance to change from more traditional work methods.
- Importance that Lake County Address Broadband Service Availability and Adoption Issues -- Over 83% of respondents indicated that the County needed to be involved in addressing broadband service availability and adoption, with an additional 11% indicating "Important". Around 6% indicated "Somewhat Important", and no respondent indicated "Not at All Important".
- Importance of Communications Technology and the Internet to Day-to-Day Business Operations -- The same respondents answered the same way to this important question, including over 83% "Very Important", 11% "Important" and 6% "Somewhat Important".
- A Reasonable Price per Month to Pay for High-Speed Business Broadband Services -- Respondents placed varying values on what was "reasonable" to pay per month for high-speed broadband. The responses ranged from \$40 per month, to \$250 per month for symmetrical fiber-based




Internet services. The most common response was \$50 per month with \$100 and \$150 also being a common response.

Analysis indicates that this is substantially lower than what most businesses are currently paying for reliable, high-speed broadband services, so affordability clearly is an issue.

- Goals That Are Not Able to Be Met Because of Broadband/Internet Challenges -- While a slight majority (56%) indicated that they were able to meet their business goals, 44% responded that they have broadband/Internet challenges that keep them from meeting their business goals. A number of impacts on their goals were provided to a follow-up question, including that broadband/Internet challenges created problems such as:
 - Not being able to attract remote workers as guests to a hotel;
 - Dropped connections which disrupt work operations;
 - Not having the competition that is needed that would potentially spur better prices and services;
 - Internet outages that create problems with clients' vendors and work activities;
 - Not being able to accurately do videoconferencing;
 - Not being able to increase services to more clients;
 - No connections during emergencies; and
 - Loss of phone communications.
- Most Important Broadband-Related Issue that the County Should Address in the Plan -- While respondents provided a number of detailed responses, most centered around key themes. The most common important broadband-related issue to the businesses was reliability.

The next most common was faster speeds.

The third most common important issue to be addressed was greater availability.

Beyond this, other important issues mentioned included affordability, more provider options and better cellular service. As one business respondent indicated, the most important broadband-related issue to them that the County should address is "Affordability and accessibility to all Lake County residents, regardless of income. broadband is a right, not a privilege."

• **Final Comments** -- All respondents were given an opportunity to provide final comments, and three respondents did, echoing similar themes that were found throughout the Survey responses. One respondent summed up the challenge as "there's no one size fits all for Lake County".





Later in the process, a focused discussion was held with members of the Lake County Winery Association. A discussion was also held with members of the Lake County Chamber of Commerce Board to obtain their response and reaction to some of the key findings developed as part of the study information included in this Updated Master Broadband Plan. The results of these discussions are incorporated in the Recommendations made at the end of this 2023 Plan.

B. <u>Libraries</u>

Libraries are considered to be critical Community Anchor Institutions (CAIs) when it comes to providing communal access to high-capacity Internet and other digital equity assets including accessible devices, education and training. The Federal NTIA and the State believe that in order to facilitate these digital inclusion capabilities and activities, libraries need to have access to broadband Internet service at 1 Gbps symmetrical download/upload levels.

The Lake County Library is integrally involved in the provision of communal Internet access and a variety of digital equity assets. It has sufficient network capability through the Statewide CENIC (Corporation for Education Network Initiatives in California) network. It is able to obtain affordable access, because CENIC works with the Library to take advantage of the Federal ERate Program which provides high-capacity broadband communications at substantially reduced prices. The Lake County Library currently finds that 250 megabits per second service at each of their Library branches is sufficient for both their internal needs and the needs of Library patrons.

Web-based materials concerning the Library were reviewed, and a subsequent interview was held with the Lake County Library Director. Key findings from the review of materials and the interview are the following:

• The Library provides in-branch and take-home digital equity assets in order to help facilitate high-capacity Internet access both in the Library and at patrons' homes -- The Library provides 31 public computers. The publicly-accessible computers (connected to high-speed Internet) can be seen as one of their more traditional digital equity assets. The Library notes that in 2022, they facilitated 15,933 computer sessions.

Regarding the provision of Internet access devices for use outside of the branch, the Library has a WiFi hot spot lending program that has 220 WiFi hot spots, and all of them are typically checked out at any given time. According to the Library, patrons call the Library every day to see if they can get a hot spot, and there's not enough currently to meet the demand. They are provided through "Mobile Beacon", in partnership with T-Mobile, and require funding of approximately \$20,000 per year out of the Library's budget. The Library has experienced hot spots that go missing or get damaged, so this complicates meeting the demand. The Library would like to expand the program but currently doesn't have the budget.





• Regarding broadband and Internet access-related services, the Library finds a need for all types of patrons which includes the diversity of the Covered Populations -- The Library has seen wide-ranging needs regarding those with language barriers, those that face disabilities and other challenges, those with digital literacy issues especially related to technology support and assistance, the specific needs of the senior population and others, and tries to meet the needs of the various populations when it comes to adoption and access-related challenges.

For example, they've implemented a program called "Tech Tuesday" that is designed to help anyone who needs more assistance with accessing the Internet for a wide variety of applications. It's mainly seniors that take advantage of the program. They've had 496 different people take advantage of Tech Tuesday since they started the program in 2021. Some of these come back continually, and in essence they're being tutored over time.

Knowing that many who use the Library's resources are looking for employment and education and training, the Library has partnered with Career Point North Bay to help work on resumes, fill out online applications, access "LinkedIn Learning" and other apps to help patrons improve their digital skills related to accessing employment opportunities.

They also, through the California State Library, utilize North Star Digital Literacy where adults, especially those with low levels of education or educational challenges, can become more digitally literate.

- The Library is a well valued and trusted resource for the Lake County community -- It is evident that people see the Library as a "safe place" to become more digitally literate, use the resources, get assistance, and achieve their objectives, when they otherwise don't have broadband or sufficient Internet access availability, don't have the skill set to effectively utilize online tools and services, or have availability but can't afford the type of access that they need and can get such at the Library. The Library notes that there are some patrons who are concerned about being tracked related to what they do online, but feel that this will not be an issue in utilizing the shared computers at the Library. Additionally, patrons have access to services that are provided through the Library, and patrons also trust the accuracy of the information they receive through the Library, because the Library gives them the skills to navigate the Internet, watch out for scams or inaccurate information and instead find information that's useful to meeting their objectives.
- Because of the limited number of Library branches, the traveling distance throughout the County and the need to move to many digital, virtual platforms during the pandemic, for those that do have access, the Library has been able to expand its services -- The Library pointed out that, while





the shared resources at the branches and the hot spot lending program were extremely beneficial, because of traveling distances and limited locations, expansion of digital programming and virtual meetings for those that have access has been a boon to the Library providing more services to the community as a whole. For example, book clubs which are very popular have continued on Zoom, and other in-person programs are being conducted in a hybrid fashion bringing in patrons who can't attend in person.

There's also digital lending through eBooks and audio books which has gone from 10% of their circulation pre-pandemic to 25% in 2023. This has been an added expense for the Library because there is a substantial demand for these digital materials. The Library pays per-use or an amount for a certain number of uses or larger amounts for simultaneous uses, so this will continue to be a budgetary issue as the demand is expected to continue to grow.

• The Library sees that it can have an even greater impact on adoption and use of online services if broadband availability can be expanded in the County -- The Library is aware from its patrons that there are substantial issues with the basic lack of service availability, reliability of service, and affordability of service, and this applies to both wireline and wireless connectivity. All these create problems with delivery of digitally-based services.

Even with the hot spot program, because it's linked into the T-Mobile network, there are certain areas, such as the area surrounding Cobb, where patrons report spotty ability to use the hot spots.

What all this means is that the underlying need for uniformly available, affordable and reliable service is the linchpin for the Library to be able to have even more success in its availability and adoption-spurring initiatives and efforts.





C. Education and Child Services

1. Educational Entities

Educational entities are another of the critical CAIs focused on at the Federal and State levels, to continue to expand and enhance their access to broadband and all the services provided through the Internet. Central to their ability to be successful besides their primary access (or "pipe") to the Internet are two other critical connectivity issues: the first is being able to connect between their central server location and all of their schools and other support facilities; and second, the ability of their parents, students, teachers, faculty and administrators to be able to continually, effectively tap into the interconnections they need with both the schools' and allied online resources.

In order to best ascertain how broadband availability and adoption expansion and enhancement occur related to educational interests in Lake County, a meeting was conducted with staff from the Lake County Office of Education (LCOE), and information was further researched related to the individual School Districts. Some of this is provided later in the Plan related to the characteristics of the various educational CAIs. Some of the key findings from the other research are as follows:

- The County's Office of Education is the key technical hub for providing high-capacity broadband Internet access to the core locations of the individual School Districts in Lake County -- There are seven (7) individual School Districts serving students throughout the Lake County area including:
 - Kelseyville Unified School District;
 - Konocti Unified School District;
 - Lakeport Unified School District;
 - Lucerne Elementary School District;
 - Middletown Unified School District;
 - Upper Lake Unified School District; and
 - The Lake County Office of Education (LCOE) which provides preschool services, hot spots, devices and services to students that need an individualized learning program.

Because the LCOE provides the core backbone of connectivity, they also manage content filtering, firewall services and other core services. The LCOE is currently in the midst of a 100-gigabit backbone upgrade using AT&T's fiber as the physical infrastructure. The LCOE manages the use of that capacity through all of its own transport equipment.

• To have a positive educational outcome for students, homes need both high-capacity, reliable Internet access and the proper devices to access it -- Once you get out of city areas in Lake County, you find numerous pockets of households with school-age children that cannot get the kind of Internet access that they need to access the educational services that they need at





home. Specifically, for example, they may have Internet access through a wireless carrier, but the only device that they have to access it is a cell phone. This is not the type of device that allows them to participate in the same types of activities that a laptop, desktop computer or even a tablet would enable.

Then there's the question of affordability. Eighty to eighty-five percent (80-85%) of students, in the communities and around the Lake itself, qualify for free or reduced lunches. So, there might be access, but it's not affordable access. For example, carriers have solutions at download speeds of 15 Mbps, 50 Mbps or higher that, while not considered served under the Federal and State definition (100 Mbps download/20 Mbps upload), would still be useful, but the price points start at \$50 to \$60 a month which is not achievable by many families in light of the other costs that they have.

- Hot spots and other devices are provided by the LCOE and individual School Districts, but the funding support for these efforts is going away -- The LCOE provided hot spots that helped bridge the gap, but funding is no longer available to support that effort. School Districts provided tablets and other computing devices for students, but those programs are beginning to end as well. A potential support mechanism could be through the Affordable Connectivity Program, but the LCOE indicates that knowledge of it is sporadic and, depending on the service level, even with the reduced cost, families may not be able to support it on an ongoing basis. Additionally, many of the families in the areas served by the School Districts don't have sufficient wireline options, so they may not be able to get the kind of access where they can even participate in the Program. Areas pointed out to look at where there is population density, but availability challenges in those areas are substantial include Upper Lake, Cobb Mountain and Spring Valley.
- Additional education and training for the parents on the need for better connectivity would be helpful -- It will be important to have policies and processes in place to educate families on the tools and resources that are available that would support positive academic outcomes for their children through access to these resources and tools online. This would help increase the perceived value of having better connectivity than just a cell phone and thus help promote adoption.
- There is a need to continue to establish partnerships to expand opportunities for students from preschool all the way through high school -- There has been a push to make connections between the School Districts and other organizations to provide, for example, after-school programs in a wide variety of areas, including access to online resources. This includes working with nonprofit agencies as well as for-profit entities.

As another example, while the children that are part of Tribal Nations go to the schools in the Districts that serve the areas where they live, many of the Tribal





Nations have their own educational centers which enhance educational outcomes by supporting the students' learning outside of the school day and beyond what the school can provide as ancillary programs. Additionally, the LCOE has worked with the Tribes to establish some point-to-point connections that would provide enhanced connectivity in their community halls or common spaces. For example, for the Elem Tribe, a point-to-point connection was made from a tower on Mount Konocti.

• Beyond K-12 learning, the community college resources in Lake County serve an important need -- There are two Community College Districts that serve Lake County including the Yuba Community College District which has a branch campus in Clear Lake and two other facilities outside of Clear Lake, Wood Lake College in Ukiah and Yuba College in Marysville. There is also the Mendocino College District that serves the northern half of the County and has a center in Lakeport. Since the pandemic, it's been noted that many students prefer to take online instruction rather than classroom-based instruction, so there is a much greater need throughout the community and at the Community Colleges themselves for online resources and associated high-capacity access to the Internet.

2. Pre-School Aged Children

To further assess the need for, and impact of, broadband and Internet access on pre-school aged children and their parents, an interview was held with the Executive Director of First 5 Lake County (First 5). Key findings from that interview are:

• Lack of sufficient access to broadband and Internet access creates challenges in accessing necessary resources for young children -- It was noted that it's a struggle for some families to access tele-services and other information that is available to the families of small children through social media and other online platforms, if such families don't have sufficient Internet access. This could be because there is not sufficient availability, or because of affordability and other challenges, or both.

For example, numerous families in Lake County live in poverty, and either can't afford broadband, or can only afford insufficient access which means there will still be challenges obtaining online resources.

Additionally, while there may be supporting resources available like the Affordable Connectivity Program, it's conceivable that many families are not aware of those resources because of their situation. As an example, there are a number of families who are homeless, and while there are support systems in place such as the Hope Center in the Clearlake area where there is access to resources, some do not take advantage of those. Accordingly, they may not have any access at all, or insufficient access such as only a cell phone with data caps and limitations on its utility.





- Many families with young children only have access to one service provider, and that service provider may only offer sub-broadband, unreliable access -- First 5 is aware that there are substantial Internet reliability problems for some of their families that do have access, and even the agency itself struggles to have consistent Internet. Additionally, there are power shutoffs that occur as part of wildfire prevention activities, but these shutoffs create additional problems with both the Internet and line-powered devices then not being available. Inconsistent, insufficient, and barely or not affordable access are all inhibitors to families that are already challenged in getting the resources that they need.
- Tele-services are very important for families with pre-school aged children -- First 5 focuses a substantial amount of its efforts on systems and other items that are designed to support children's health and wellness. In many cases, this requires families to be able to access developmental services, some of which are not available from in-person providers in the County. In these cases, the families have to go out of the County, or be able to take advantage of tele-health and other online services to get the resources and the support they need. Without sufficient connectivity to the Internet, there is a disconnect between the services they need and their ability to access them.

It also inhibits these families from getting basic information through outreach from First 5, if they're not able to consistently and reliably receive this information.

- There is a substantial lack of access to devices needed to adequately use online resources, especially for low-income families -- First 5 finds that the types of devices that some of the families have to access the Internet don't enable them to utilize all of the available online resources. This is especially problematic for those with disability challenges that may need additional peripheral or ancillary devices that help provide accessibility. While there are some support systems in place to be able to get better devices for basic access to the Internet, there are less of those types of programs for necessary peripheral and ancillary devices. This is an area where additional funding for qualifying families would be beneficial.
- For the families of very young children, the broadband and Internet access challenges are the same as for other Covered Populations -- Specifically, this can be summed up as availability, affordability and sufficient "connectability" or connectivity that are the primary needs of families with young children. Expansions and enhancements that solve these challenges for other populations will help resolve them for these families as well.





3. <u>School District Digital Equity Assets</u>

The individual School Districts in Lake County provide various digital equity assets for students, parents, teachers, staff and administrators. The following assets were identified through research of web-based materials:

- Kelseyville Unified School District -- Facilities and services provided by this District include:
 - The District's IT Department provides information through an "IT Tech Lounge" which provides answers to frequently asked questions and quick fixes regarding technology issues.
 - IT also provides information about affordable Internet access programs offered by Mediacom.
 - Each District school has a computer lab where students can access the Internet and use necessary applications.
- Konocti Unified School District -- This District offers the following digital equity assets:
 - The District has purchased one-to-one Chromebooks for the students, initially provided through CARES Act funding, as well as provided hot spots for students without Internet access.
 - The District provides a hotline for parents and students to obtain help with the use of technology.
- Lakeport Unified School District -- This District provides the following digital equity assets:
 - $\circ\;$ Devices are provided for students in grades 6-12 to take and utilize at their homes.
 - Similar to the above, the District's Office of Technology provides a help desk for parents to obtain information to enable effective utilization of the devices provided to students.
- **Middletown Unified School District --** This District provides the following digital equity assets:
 - The Middletown High School library allows students to check out a Chromebook for the entirety of the school year.





- **Upper Lake Unified School District --** This District provides the following digital equity assets:
 - The District's Technology Services Department provides a web-based IT help desk for parents and students to obtain assistance with the use of technology.
 - D. Public Safety and Emergency Services

Public safety locations are also considered critical CAIs that require the availability of high-capacity infrastructure and services. This is especially true in the case of emergency services, where the County and other local agencies need to coordinate on emergency responses and further provide information to the community at large. Information was gathered from the Lake County Emergency Services Manager and the Sheriff's Office concerning the broadband communications environment as it applies to public safety, emergency preparedness and emergency response. Key findings from that discussion are:

• The County has good connectivity at its Sheriff's Office locations but emergency responders face challenges out in the community -- It was noted that communications access, especially for broadband data communications, is spotty as soon as you leave a densely populated area. One of the challenges is that problematic events will occur in areas of the County that are either very sparsely populated or have no population at all. Consequently, there won't be any cellular broadband service because there's no client base; yet reliable broadband data communications may be critical in that area. The County's mobile public safety data operations are largely cellular broadband-based, but can utilize WiFi where available. One of the problems, even when there is cellular broadband availability, is that an emergency event tends to "clog" the network (too much contention for too limited capacity), and that creates dropout and other access related problems.

Nationally, knowing that public safety entities face such challenges all over the country, FirstNet has been rapidly deploying. This is occurring in Lake County, and this will help resolve some of the County's challenges. However, the system is only accessible to public safety, not to the community at large.

The County has also recently invested in Starlink, which is accessible in some areas where no other data communications technology is available.

• Public safety vertical assets such as towers are being utilized where feasible to provide access to ISPs for residential and business communications -- The Sheriff's Office noted that the County owns a number of towers that are used for public safety radio communication with an additional two towers rented. The County's tower on Buckingham Peak on Mount Konocti





serves as a placement location for the antennas of several ISPs, along with cellular companies.

- When there is an event such as a wildfire where the County wants to provide information to residents, one of the issues is ensuring reliable receipt of those communications -- The Sheriff's Office noted that while they use reverse 911 for cell and landlines, they also provide information by text, email and social media. Where these various communications technologies may be either unreliable or not available, that substantially complicates getting critical information out to the public. Ideally, there would be multiple, typically reliable methods to get information so that if anyone fails, the message will still get through. It is critical in an emergency situation that a message to evacuate or indicating another way to respond to the emergency is transmitted and received quickly and accurately in order for it to be effective.
- There are a variety of locations within the County that are problematic when it comes to both the public being able to receive emergency messages and public safety assets being able to get critical information back from a remote location – The Sheriff's Office noted the following locations:
 - Jerusalem Valley, which is behind the Hidden Valley Lake subdivision;
 - The Lake Pillsbury Basin;
 - The south Middletown Area;
 - $\circ~$ South of the Twin Pine Casino, between the Highway 20 corridor and the subdivisions, and
 - Between Highway 53 and the Lake County line.
- One of the challenges for residents being able to uniformly access highcapacity broadband is the affordability of that service -- The Sheriff's Office noted that there have been substantial price increases from some of the bigger broadband providers in the County.

Also, even if you can afford the high price, there are problems with the service in dealing with power outages and with over-subscription, so you don't necessarily get the service you're paying for.

Accordingly, it's important to understand that challenges with broadband are not just in the sparsely populated sections of Lake County, but even in areas like downtown Lakeport.





E. Incorporated Municipalities

To understand how the broadband environment may differ in the incorporated municipalities as opposed to the unincorporated County, a focused discussion was held with the City Managers of Clearlake and Lakeport. The key findings from that discussion are as follows:

- From a broadband availability standpoint, Clearlake and Lakeport are fairly well situated -- Both Clearlake and Lakeport are served by Mediacom and AT&T throughout their corporate limits. Mediacom's service enables the jurisdictions to have a "served" status by providing greater than 100 Mbps download/20 Mbps upload throughout its service territory, and both Mediacom and AT&T provide FTTP service to businesses. Both City Managers indicated, though, that broadband service drops off substantially just outside of the cities. Consequently, because the two cities are regional hubs for business and government services, not having the same type of availability in the surrounding areas has a negative impact on the cities despite the service levels within the cities.
- There are challenges to adoption of broadband service within the cities Both City Managers indicated that affordability is an issue. It was noted that, despite available service, including during the pandemic, many households were struggling to participate in virtual, online activities because of their inability to afford necessary broadband service levels.

Additionally, as more services went online, certain groups were left behind based on lack of necessary education and training, or being ill at ease in adopting online methods of receiving services or participating in activities. Seniors in the cities, especially, were mentioned as one of the key groups that continue to need education and training, or are resistant to becoming more involved in online activities.

The City Managers noted that it is important that all of their residents are able to fully participate from a digital equity standpoint, since the jurisdictions are pursuing greater engagement online. For example, Lakeport is looking at developing a 311 program where residents can report their issues digitally. The city also continues to develop more online transaction systems like utility billing and online permitting and licensing. All of these require a reasonable level of expertise in utilizing the systems.

• Both Clearlake and Lakeport are continuing to work to expand public access to the Internet, primarily through free public WiFi -- Lakeport began a project to create free public WiFi in its downtown area and in its parks. It had some issues with successfully partnering with ISPs to provide that service, but are continuing to pursue various scenarios for providing the service. Such a service would cover all the publicly-owned spaces in the downtown area





including the Lakeport community center, City Hall and all its waterfront parkland areas.

Clearlake already provides free access to the Internet in City Hall and its largest park, Austin Park. It's continuing to develop its free Internet access program including the upcoming provision of free access in Redmond Park and in a new park that will be under construction in 2024. The goal is to have free access in all of the public parks. Clearlake, rather than working with an ISP directly on the WiFi system, is using its existing fiber-based connection as a backhaul for hot spots that it has developed and will be developing in these areas. One of the scenarios Lakeport is looking at is a similar type of model for free public Internet access.

- City facilities are fairly well served with high-capacity connections -- For example, Clearlake has fiber optic connections from both AT&T and Mediacom, specifically to ensure redundancy for city communications, especially for the dispatch center at the Police Department. For Lakeport, basic connectivity is through Mediacom, and it's also developing additional connections with AT&T, initially focusing on its wastewater treatment facility. This will also include the Police Department, City Hall and all their main buildings to ensure resilient operations as well.
- Because of the high level of broadband coverage now, both cities are able to move forward on city projects and ensure that they will be served -- For example, Clearlake will be developing a recreation center as part of its new parks project, and it is developing a retail center with some medical facilities on about 40 acres along Highway 53. Because of adequate fiber optic and other broadband infrastructure in that area, and the fact that the cities coordinate with the providers early on in development projects, Clearlake does not believe there will be any issues in ensuring high-capacity service at those locations. They also have several housing projects under development, which are slated to have service available prior to occupancy.

Lakeport's process is similar and believes this will be advantageous in any development that it continues to pursue in the downtown waterfront area. The City Manager indicated that it would be important, again from a regional perspective to partner with the County in ensuring that areas just outside of the city are the focus of broadband expansion efforts that will benefit both.

F. Special Districts

Special Districts provides water and sewer service to over 30,000 customers in Lake County. The agency also administers 9 lighting districts, including maintaining decorative lights in Kelseyville and Upper Lake. The use of broadband related to the water and sewer service it provides is centered around transactions with the customers as well as use of broadband networks for connections to its facilities. A discussion was





held with the Director in order to ascertain how the current broadband environment in Lake County impacts the agency's operations. Key findings from the discussion include:

- Special Districts' online transactions with customers can be impacted by spotty connections -- For those that make online payments, connectivity can make it inconvenient or difficult to do transactions. For some, especially elderly customers, it's more of a personal choice to use traditional paper-based methods.
- Special Districts have connectivity issues in some of its remote facility locations -- For example, in Kelseyville, where the main yard is, the agency uses a wireless microwave to the County's tower on Mount Konocti, but there is inconsistent service. The Director noted that weather can create problems with the connection.

There is a cable-based Internet connection to the Soda Bay water treatment facility, but there are intermittent problems with it so there are quality issues. The problems created don't affect plant operations since there are manual modes to continue operations. Additionally, the network is used to gather data, so data can be lost. However, it can also be cached locally until a connection is reestablished.

Where it can impact operations is when staff loses access to the County network and applications and files on the server. They then aren't able to access these functions, such as the timecard system, until the connection is reestablished.

- Problematic connectivity can also affect operations at a customer's location -- For example, automated meter reading (AMR) systems are radiobased and topographical challenges can create problems with retrieving necessary information. It was noted that this limits the ability for the automated systems to be utilized throughout the County, so a connection tech and other related positions have to go out and read meters. If more AMR were available, then it would free up the staff to do other activities and create higher efficiency.
- There may be some opportunities for helping facilitate expanded broadband construction with Special Districts facilities implementation Special Districts has some facilities, such as water tanks or streetlights that it owns, that can be utilized for locating antennas. Most of its pipe infrastructure replacements are short runs at deep underground depths for water mains that may not necessarily be conducive to implementing broadband communications cabling. The agency would be interested in exploring options that work for both Special Districts and the providers.





• There are potential options for developing collocated communications systems for both Special Districts use and commercial use -- For example, Special Districts has been reviewing moving to more of a cellular wireless connectivity to increase capacity and flexibility versus older copper-based connections in facilities like remote lift stations. Potentially, private intranet wireless-based connectivity could be established where the structure would also support commercial wireless Internet.

G. Health Services

Health facilities and services are also considered critical CAIs by the State and Federal government and as such are focused on having high-capacity 1 Gbps symmetrical availability. They are also a focus of upcoming grants to support health-related digital equity initiatives. There are additionally specific grant funds for telehealth initiatives.

An in-depth discussion with representatives from Lake County's Department of Health Services, demonstrated the following key findings related to broadband and Internet access as it affects public health:

• Broadband is considered to be a super determinant of health - Specifically, Health Services' staff noted that access to broadband affects four of the five social determinants of health: education, health care, employment and social connections, which in turn have an impact on approximately 70% of a person's health outcomes.

Lake County is 56th out of 58 counties in terms of health outcomes in California, and a substantial lack of digital equity was noted as contributing to that ranking.

 As a large rural county, with a relatively small population, Lake County also ranks lower in access to health care – Specifically, it was shared that Lake County has 67 primary care providers per 100,000 population, and the average in the United States is 50% higher than that at 104 per 100,000. This places a great emphasis on telehealth and other online services, and when you're unable to get a sufficient level of Internet access, or those levels aren't available to you because of affordability, access to necessary telehealth can be problematic.

County Health Services' representatives also noted that another reason telehealth is so important in Lake County is that geographically there is a large lake in the middle of the County surrounded by mountains. Especially if you don't have reliable transportation and there's a lack of healthcare providers, you might have to secure an appointment with primary care in an adjacent county, and take an entire day off of work when you're paid hourly. In such cases, the challenges to getting necessary health care were described as nearly insurmountable.





• Impacts on the County's Community Health Needs Assessment (CHNA) and the associated Community Health Improvement Plan (CHIP) - A goal to improve access to care was established in the CHIP, which included increasing access to telehealth, but it's complicated by insufficient access to broadband internet, which was identified as a barrier that needed to be overcome.

Also, as part of the assessment and plan, aging populations, indigenous populations, people living in poverty, people experiencing substance use disorder (which is a substantial problem per capita in Lake County, and those with mental health issues were identified as those that have substantial health challenges as a group, so require a specific focus for improving health outcomes.

Associated with this, once you have access to broadband internet, is the need for education to expand digital literacy, especially to aging populations. Then there are community members experiencing homelessness who may have access to a device, but don't have a place to charge it and don't have a safe or private place to have a telehealth session.

• Establishing expanded broadband availability to health clinics and facilities is another critical component of improving health outcomes - For example, several of the most problematic areas concerning both broadband and health outcomes. include Lucerne, Clearlake Oaks, and other areas around Clearlake where expanded access will not only help residents but will help healthcare locations.

Additionally, during emergencies, often pop-up clinics need to be established in areas where people may have been relocated related to some type of disaster or emergency. Sometimes these locations can be extremely challenging to get the necessary broadband access.

Additionally, County employees from agencies such as Health Services' Environmental Health Division are charged with going out into people's properties to do inspections and assess environmental health. This requires access to staff back at a central location as well as connections to applications and software in order to do the appropriate work. If such access is not available, then double the amount of work needs to be done once the Environmental Health employee arrives back at the central location.

Further, necessary activities like mass vaccination clinics, which were so important during the pandemic, were described by Health Services staff as being extremely challenging based on insufficient broadband access which slowed down the entire operations of the clinic. This caused problematic backlogs for employees recording vaccinations and reporting it to CARES and community members using the system, ultimately causing it to crash, creating massive disruptions.





One idea is to provide completely subsidized broadband to those that meet qualifying criteria documenting the most challenges - It was noted that even low-cost access or subsidized access that ultimately runs out, creates a huge sustainable access problem for the most vulnerable populations; i.e., for those that have to make critical decisions between basic food, clothing and shelter needs versus paying even a small sum for Internet access. Accordingly, if the County or some type of nonprofit could establish an ongoing, completely subsidized broadband/Internet access program for the most vulnerable, along with associated support systems which help enable effective use of online programs and tools, this could be a big help in contributing to improved health outcomes.

There would need to be a preassessment, and a post assessment when the program may no longer be needed because of improved circumstances, which would provide benchmarks for the effectiveness of the program, in order that it could be modified as needed to be highly effective and sustainable. However, these types of assessments and tracking functions cannot involve myriad forms and other types of administrative burdens for the vulnerable populations. If so, the staff's experience has been that they will abandon the initiative entirely. Added to that, staff indicated that vulnerable populations that include undocumented residents, stay away from such programs when they have to provide information that ultimately may solve a problem for them in one area, but create problems for them with other parts of their existence within the County.

H. Agriculture Sector

Agriculture is one of the largest industries in Lake County and reflects a large portion of the gross domestic product (GDP) generated in the County. A number of materials and documents were reviewed, as well as interviews conducted with the County's Agricultural Commissioner, the President of the Lake County Winegrape Commission and a representative from Scully Packing, in order to assess the impact of broadband on agricultural activities in Lake County. The key findings are:

• While the bulk of agricultural activity is necessarily in person, more and more key supporting activities require online access - For example, related to communications in the field, especially on large tracts of land, it's important to have access to production-related databases, communications between supervisors and employees, and networking between offices and off-site facilities.

Because of the necessarily remote locations of some of the farmland that is worked, access to broadband networks and services can be severely limited or nonexistent. This can require substantial workarounds to ensure necessary connectivity. For example, in one farming location, rather than having individual





access to cellular systems, WiFi relay networks from a connected base location needed to be established. As one interviewee noted, "it's very hit and miss depending on where you are in the County", including many areas where farm activities are conducted.

- This is not just a Lake County issue, but a regional issue Some of the agricultural producers in Lake County farm in multiple rural counties and face these issues across jurisdictions. This indicates that synergistic planning on a regional level could help solve the multiple connectivity issues that producers based in, or working in, Lake County face.
- Broadband Internet access connectivity issues not only impact agricultural producers, but also their workers Continuing with the "hit or miss" aspect of connectivity in Lake County, some year-round workers will have access at their farm employer location, but not at their residence in a less connected area of the County. Similarly, they may have sufficient access at home, but not in various areas of the farmland where they're working. This, again, not only impacts the efficiency of communications between employee and employer, but also the quality of life for the worker.

This is also true of seasonal workers, who may be housed at the farms where they're working. Just to have normal communications through cellular or WiFi systems sometimes requires the producer to establish a significant communications infrastructure of their own. Their own infrastructure, though, may have to rely on insufficient connectivity to that infrastructure so online access for their seasonal workers may still be problematic.

- **Broadband affordability** As for other sectors, cost is a substantial issue for agricultural producers. For those that do have sufficient access between their facilities, where they may have fiber optic, high-capacity fiber optic connectivity, for example, the cost again is substantially more than it would be in more densely populated areas. For example, Scully Packing has a fiber optic connection between its key facilities and has a sufficient level of access at this point of 100 Mbps, but it pays much more than what it would pay for such connectivity in locations closer to metropolitan areas.
- Part of the "hit or miss" aspect of broadband or sub broadband networks in farming areas are the age of and the associated maintenance requirements related to the Internet service infrastructure - Interviewees noted that not only is wireline access in more remote areas limited, it's also largely older, copper-based DSL. The experience of producers relying on DSL connections is that the service has substantial reliability issues in remote areas. Additionally, they encounter significant service delays when problems are experienced in remote areas and these problems, again, substantially impact efficiency and productivity.





• There are many agricultural support activities that require online access, and this will only continue to increase - As an example, there are an increasing number of monitoring stations and applications needed throughout the area farmed in order to monitor conditions. This includes soil moisture monitors, pump monitors, weather stations and other equipment where real time data is necessary in order to support required farm activities.

Additionally, producers use crew attendance software, and access to cloudbased databases for both information retrieval and storage. They also participate in continuing education webinars and seminars; and virtual meetings with other producers, associations and organizations that they're involved in, with many of these activities requiring continuous, real-time access. Further with the advent of the incorporation of more automated systems; including systems driven by Internet of Things (IoT) technologies and Artificial Intelligence (AI), high capacity, reliable connections will be needed.

All of this points up the need to establish greater levels of broadband Internet access in agricultural production areas of Lake County.

I. Tribal Nations

There are seven (7) Tribal Nations within the boundaries of Lake County, including: Middletown Rancheria of Pomo Indians of California; Habematolel Pomo Indians of Upper Lake; Robinson Rancheria of Pomo Indians of California; Big Valley Band of Pomo Indians; Scotts Valley Band of Pomo Indians; the Elem Indian Colony; and the Koi Nation of Northern California. They receive services from the Internet Service Providers (ISPs) that serve residents throughout the County. Materials reviewed and information received from the Tribes indicates that they are experiencing the same availability, affordability and accessibility challenges that others are experiencing in the County.

Under Federal law, Tribal Nations have access to a pool of broadband deployment and adoption funds separate from the funding available to State and local governments, broadband providers and other public sector and private sector entities. As described below, the Tribal Nations within the Lake County area have plans to expand and enhance broadband on their Tribal lands and continue to pursue those funding sources.

Outreach was made to representatives at each of the Tribal Nations, and detailed interviews and focused discussions were able to be held with three (3) of the Tribal Nations. Key findings from those discussions are described below:

1. <u>Middletown Rancheria of Pomo Indians of California (Middletown</u> <u>Rancheria)</u>

The discussion with the Middletown Rancheria included the Tribal Chairman (who is also the District 1 Supervisor on the Lake County Board of Supervisors), the Tribal Administrator and their energy and infrastructure consultant from Baker Tilly. The Middletown Rancheria currently has approximately 35 homes with about 60 or 70 Tribal





members living on what will be growing from 100 acres to approximately 353 acres. The Tribe operates businesses including a casino and provides services to both its Tribal members and members of the surrounding Middletown community.

Key findings from the discussion are:

• There are problems with the Internet access services provided to the Tribe's members and its facilities -- Many Tribal residents are only able to access DSL, and the speeds obtained are sub-broadband at approximately 20 Mbps in the download direction. Others access cellular networks like T-Mobile through hot spots, and a couple residents are utilizing Starlink.

Residents report not only slow speeds, especially in multi-generational households where the entire family will be trying to access the same subbroadband connection, but also reliability issues related to intermittent service and outages. Additionally, there are affordability issues, since the connections cost approximately \$120 per month, which in more dense areas will support a much higher speed and more reliable connection.

- Expanding broadband access on the Rancheria is critical to the Tribe's plans to expand services -- Specifically, Middletown Rancheria is building a permanent health clinic which will also have an emergency hub component with backup generation and solar power. As part of this, they want to add telehealth services, which will require Tribal members to have higher speed and more reliable Internet access. They are also building out their energy utility utilizing micro-grid technology, which will require better connectivity for monitoring, control and service provision functions. Essentially, with many enhancements in progress, expansion and enhancement of broadband is a key supporting component.
- Information requirements are an inhibitor to accessing broadband cost subsidization programs like the Affordable Connectivity Program -- These types of programs require a lot of personal information, in order to qualify ISP customers for reduced or free access to services. There is a historical trust issue between Tribal members and Federal, State and other government programs since that information can be used as part of "tracking" respondents.

This is a well-known adoption inhibitor, and entities like the CPUC and the Federal NTIA have been made aware that these types of requirements inhibit broadband adoption.

• Some Tribal members have outdated devices that would need updating in order to take advantage of current online resources -- Participants in the discussion noted that laptops and tablets were supplied 3-4 years ago, but with Internet access device technology evolving rapidly, such devices would need updating in order to take advantage of expanded online access and resources.





One supporting mechanism being considered is to expand communal, public access to Tribal members, perhaps with public computers at the Tribal administration building. This could be provided in conjunction with the new education clinic that's been developed and the new Tribal office that will be built.

• The Tribe is working on long-term solutions to expand and enhance broadband access through systems owned by the Tribe -- Middletown Rancheria is currently working on two network development projects: the first would provide a high-capacity microwave backhaul connection from an ISP location to a monopole tower to be erected on the highest point of the Rancheria that would greatly expand the Internet access "pipe" coming into the Tribal lands. This tower could also collocate with a private ISP who could then utilize it to better provide service to the surrounding community and could also provide a revenue-generating lease for the Tribe.

After that, the second design is to, from that point, develop a fiber to the premises system that would provide high-capacity fiber optic-based connectivity to every Tribal member on the Rancheria. The Tribe sought a grant from the NTIA to help support the development of the FTTP system but did not receive an award for such. However, it is trying to seek additional funds slated from the BEAD Program that will be available for applications from Tribal Nations.

Also, because the Rancheria is right along the Highway 20 corridor where the Statewide Middle Mile is slated to be built, it will work to tie into that Middle Mile, which will allow additional ISPs to come in and provide Last Mile services to the Tribe.

2. <u>Habematolel Pomo Indians of Upper Lake (HPUL)</u>

The HPUL Tribe has about 286 members, of which 113 are youth and 173 are adult members. Many are situated in Upper Lake, but the Tribe is considered landless and is spread throughout the community. As described below, the HPUL are very community-centric in that they provide a lot of services to surrounding non-Tribal community members. The discussion with the HPUL included their Vice Chair, two Members at Large, the Executive Council Secretary and the Environmental Director. Key findings from the discussion are:

• The HPUL Tribe provides a number of services to the Upper Lake community, and therefore the entire community will benefit from expanded broadband services for the Tribe -- Specifically, the HPUL provides jobs and services through its casino and restaurants and a lending business. It is also in close proximity to the elementary, middle and high schools of the Upper Lake Unified School District, and it has a community





building which not only hosts meetings for the Tribe but also Town Hall meetings for the general community. The community building has also served as an evacuation center, which was beneficial during recent wildfires, and as a warming and cooling center.

The community building, for example, can host virtual and hybrid meetings but is somewhat limited by the existing Internet access connection.

- Lack of high-capacity broadband and problematic Internet access are problems for the Tribal administration and businesses as well as the community at large -- In Upper Lake, the primary Internet connectivity technology is DSL and cellular. Upper Lake has hilly and mountainous topography, and consequently cellular service can be extremely problematic. For example, the School District provided some hot spots to some of the students, but they couldn't access the cellular network because of limited coverage and, therefore they were not useful. One of the Tribal departments recently moved to a Starlink connection, and this has improved their access.
- Lack of necessary Internet access further complicates the provision of Tribal services -- Many of the Tribe's programs are accessible through their website. This includes applying for scholarships and other opportunities and providing information, including emergency information. For example, the Tribe conducts a weekly Zoom meeting where they present the latest information to Tribal members and then records those and places them on their website. They also use social media and other platforms. However, because of the limitations of current Internet access connectivity in the Upper Lake area, they are working on a system that's based on text messages. Even those won't be effective in areas where cell service is nonexistent.
- The Tribe makes it a point to ensure that Tribal members have necessary access devices -- This includes an electronic device program where every three years, youth Tribal members are able to get scholarship opportunities to have up to \$1,500 for laptops or desktops and peripherals, and another program for adult members that allows up to \$1,000 for a tablet, laptop or desktop. However, with limited Internet access, the utility of the device is not as beneficial as it could be. Additionally, even substandard access for Tribal members can present cost challenges, so the affordability of sufficient access, even when devices are provided, is problematic.
- The Tribe is looking at options for providing public access to computers and educational resources in its core facilities -- The Tribe has an Education Center and a Cultural Resources Department that is looking into putting in publicly available computers that will work in tandem with the library's educational resources that can serve to boost digital literacy. The community building could also be outfitted with publicly available computers and, again,





provide capabilities to Tribal members and surrounding community members that have extremely limited, sub-broadband Internet access or no access at all.

• The Tribe has secured broadband funding for enhancing broadband in the Upper Lake community -- The HPUL were able to secure \$500,000 from a Federal NTIA grant to deploy broadband infrastructure and expand and enhance the level of broadband for the Tribal community. The original HPUL application, though, was for substantially more funding for putting in an entire network. Utilizing the sum received, they are now looking into putting up a tower which will enable the provision of much higher levels of broadband service to the Tribal community. Their original goal was to put up multiple towers to serve the surrounding areas as well, or to serve as locations where private ISPs could place their facilities and provide access to the Upper Lake community at large. The HPUL will continue to look at additional funding opportunities to try to meet its original mission of providing significantly expanded broadband to the Upper Lake community. The HPUL noted that a high-capacity wireless system would likely provide the best cost-benefit for expanding service in their area.

Additionally, they are pursuing more housing opportunities for Tribal members, and development of a high-capacity broadband system would ensure that the new housing has broadband availability concurrent with its initial occupancy.

3. <u>Robinson Rancheria of Pomo Indians of California (Robinson</u> <u>Rancheria)</u>

The Robinson Rancheria, also located in the Upper Lake part of the County along Highway 20, currently comprises 107 acres, with an additional 800 acres coming into trust. The Rancheria is focused on adding additional housing with approximately 60 homes at this point. Robinson Rancheria is working on adding more as part of its updated Master Plan for the Tribe. As part of its housing plan, Robinson Rancheria wants to ensure that all homes are pre-wired for broadband service so that it can be available when occupancy occurs, and are pre-wiring for green technologies as well, such as solar power. There are approximately 576 total Tribal members, some of which live on Tribal lands in Lake County. Some of the Tribal members live in other portions of the County, and many live outside the County.

An interview was held with the Secretary-Treasurer of the Tribe to explore issues related to the Tribe and the impact, or lack thereof, of broadband service on Tribal lands and on the surrounding community. Key findings from that interview are:

• The Robinson Rancheria provides many services to the community, and similar to others, all of the services benefit from having sufficient broadband availability -- The Tribe operates a casino, a gas station, a smoke shop and a recycling center, and because it's the only one in that part of the region, it's very popular. People even come from Mendocino County to utilize





it. The Tribe is always looking for new business opportunities, because they are beneficial to both the Tribe and the entire surrounding community, but the Rancheria needs to ensure that those businesses can be supported by necessary broadband. Internet Access is provided on the Rancheria and to surrounding areas by cable modem, DSL and cellular broadband. The Rancheria's core facilities are sufficiently served at this point. However, many of the Tribal members don't have it or have insufficient access. This is true for surrounding community members as well.

• The Tribe provides Tribal member access to the Internet in their Education Center, through both member accessible computers and WiFi -- For Tribal members that have insufficient access, lack of appropriate devices or affordability issues, the Tribe provides member access to the Internet. Affordability of ISP services for individual Tribal members is an issue with access costing somewhere from \$60 to \$90 a month, which is not affordable for some Tribal members.

Additionally, some Tribal members only have access through cell phones, and some of these cell phones are the type where you have to keep reloading funding for the service and are limited by a data cap.

The Education Center also provides equipment for virtual meetings and educational purposes for Tribal members.

• The Tribe wants to leverage the Statewide Middle Mile which will pass right by the Rancheria -- The Tribe is looking into pursuing grant funds that would enable deployment of higher capacity infrastructure throughout the Tribal lands that would take advantage of interconnecting into the planned Statewide Middle Mile running along Highway 20. It believes that this would not only provide benefits to Tribal members, but to the surrounding community as well.

4. Broadband-related Activities of Other Tribal Nations in Lake County

Although meetings weren't able to be held as of the date of the Plan Update with other Tribes in Lake County, research indicates that both the Big Valley Band of Pomo Indians and the Scotts Valley Band of Pomo Indians have received grant funds to expand and enhance broadband infrastructure and service for those Tribes. Specifically:

a. Big Valley Band of Pomo Indians

The Big Valley Band of Pomo Indians resides on 153 acres in the Big Valley area of the County and operates the Konocti Vista Casino. They recently received a grant from the Indian Community Development Block Grant Program to build a new Education Center and have a Tribal member access computer in their library. They also operate a Tribal Utility Authority.





Recently they received a \$951,684 grant from the NTIA for a FTTP deployment. The project includes construction of a 3.6-mile fiber network to connect 90 unserved Big Valley Tribal households as well as 67 unserved businesses and community anchor institutions. This will provide service levels from 100 Mbps symmetrical up to 1 Gbps symmetrical for the CAIs. It will also provide equipment for the currently unserved households to access the network.

b. Scotts Valley Band of Pomo Indians

The Scotts Valley Band of Pomo Indians (SVBPI) is a landless Tribe currently comprised of approximately 300 Tribal members. The Tribal office in Lake County is in the City of Lakeport.

The Scotts Valley Tribe recently received a \$584,000 grant from the NTIA to provide mobile hot spots with 12 months of service, as well as laptops to those without a qualifying device, to eligible adults and all high school-age Tribal members. This will expand broadband capabilities, adoption and utilization for eligible members of the Tribe.

J. <u>Community Development</u>

Community Development is responsible for planning activities within the County including updates to the Master Plan, working on housing plans, reviewing and enforcing zoning requirements and serving as staff to the Planning Commission. An interview was conducted with the Community Development Director regarding Planning and its relationship to broadband deployment and adoption needs within the County. The key findings from that discussion are:

• Development tends to align with highways and Clear Lake as well as flat areas -- This is where much of the current broadband infrastructure and services are, however, not uniformly. Lack of uniform access is one of the most impactful issues because a lack of necessary infrastructure and services is one of the things that holds back development.

Then, as you get out into sparsely populated areas of the County, there is very limited, or no connectivity at all. The State's planned Middle Mile will help; in that it runs through a number of areas that could use improved connectivity. For example, the intended Middle Mile construction plan follows Route 175 through Cobb which is a forested area that could use improved connectivity. This is, for example, where artist communities tend to be located.

• Areas in the County have been significantly impacted by wildfires, and the rebuilding of broadband infrastructure, or even initial implementation in those areas, has not been occurring -- FEMA estimates that nearly all the County is in a high fire severity zone. This in many ways creates a conundrum, since emergency communications are critical; however, the infrastructure





needs to be hardened, and that's costly, in order to be survivable in those areas.

As an example, 1,500 homes were lost in a valley fire from Forest Lake along Highway 175 south to Middletown. Only a small percentage of those have been rebuilt, but development is expected to continue. Because it is being redeveloped individually and slowly, broadband access has not arrived in those areas.

• Substandard housing also creates issues with access -- Areas such as Clear Lake Oaks and Double Eagle have been the focus of a task force to clean up problems with housing in those areas. These are also areas that suffer from substandard Internet access. If it was feasible to upgrade the Internet access as those neighborhoods are cleaned up, this was described as having the potential to substantially boost the quality of life in those areas.

Those would also be areas to promote affordable Internet access programs such as the Affordable Connectivity Program, because increasing affordability and upgrading availability in those areas would benefit both existing and future renters.

An example in these areas provided by the Director included experiences of students during the pandemic where they were given devices such as Chromebooks but couldn't fully utilize them because of insufficient access to the Internet. There are areas under development where it will be important to focus on expansion and enhancement of broadband services in those areas prior to occupancy taking place. For example, there is special needs housing being developed in Nice and Lucerne where it will be important to integrate broadband expansion and enhancement efforts into development of the housing. Overall enhanced Internet access would be beneficial in that and many other housing development instances.

- There should also be broadband deployment as road improvement projects are conducted -- For example, there is the South Main Street area where there is a road improvement project planned and coordinating that with broadband enhancement and expansion was described as having the potential to substantially reduce the cost and help facilitate broadband deployment to be expanded in that area.
- There is substantial cannabis development in the southern part of the County where connectivity is limited, but such development needs to be supported by sufficient broadband Internet access -- Specifically, while cannabis development is designed to occur in the rural areas, the industry has daily reporting and security systems mandated by the State that need consistent, reliable, high-capacity broadband service.





Current development is in the southern part of the County along Spruce Grove Road and Morgan Valley Road near Lower Lake. Other, areas of cannabis growing are in the Upper Lake area and Clover Valley. It's all in rural areas, but because it is a growth industry, it needs to be supported by sufficient broadband Internet access. The Director noted that there should be a focus on meeting this need.

K. Lake County Planning Commission

Subsequent to the interview with the Director, a presentation was made to, and a discussion held with, the Lake County Planning Commission. Key findings from that discussion are:

• Expanding broadband service for existing businesses would improve both business and customer access -- Better and more reliable Internet service would not only enable more efficient and productive business operations, but it would also help businesses provide that resource to customers. The more that existing businesses could provide free Internet service to the community, the more the community may both engage with that business and have greater online access capabilities.

As broadband expands to better serve the business community, participants shared that there also needs to be a focus on increasing reliability and affordability of those services. That is a challenge in that broadband expansion and implementation of reliability enhancing mechanisms could serve to increase the cost, unless there is funding available to support providers' expansion efforts.

One planned development that would be a significant boon is the advent of the State's Middle Mile infrastructure. This infrastructure is being designed to provide an Open Access Network backbone infrastructure through key corridors of the County that will enable more cost-effective Last Mile connections to businesses and more competition between Internet Service Providers. While Phase 1 construction of the State's planned Middle Mile leaves out some previously planned infrastructure that would have circumnavigated Clear Lake, the remainder, once built, is projected to be a substantial asset that will help facilitate broadband expansion, not only to businesses but to residents.

 It's important for new housing construction in both single-family unit (SFU) subdivisions as well as apartment buildings and other multiple dwelling units (MDU) to have broadband infrastructure already installed and be able to be connected concurrent with occupancy -- It's important that policies, procedures and requirements, as feasible, be put in place to ensure that new housing is capable of providing broadband Internet access to





residents as they take occupancy. This should be a part of the Implementation Plan.

- The community at large should be engaged in continuing to provide input into the County's efforts going forward regarding broadband planning --It will be important that the community at large in Lake County is provided opportunities to continue to provide information about their needs and continue to be engaged in the planning process. For example, additional surveys (whether in written or online form and in both English and Spanish) should be pursued through government agency, schools and nonprofit outreach. This will help keep the community at large engaged and will help continue to focus broadband planning efforts on the portions of the community most in need.
 - L. Social Services

Social Services includes those departments, agencies and divisions that focus on a wide range of issues related to the Covered Populations. As part of developing the Plan Update, information was obtained from Lake County's Department of Social Services including a review of its programs and services, as well as a focused discussion with the Director, the Program Manager for the Area Agency on Aging and the Deputy Director of Adult Services. Key findings from the review of materials and the focused discussion include:

• The most vulnerable populations in Lake County are also those struggling with access to broadband and the Internet -- For example, the County provides In-Home Support Services (IHSS) to nearly 2,500 people in Lake County. Many of them do not have adequate Internet access, which complicates their ability to receive supportive services and information, such as disaster and other emergency-related information.

As an example, discussion participants noted that IHSS clients have timesheets that need to be completed, and because of insufficient online access, they use a telephone system which is challenging in itself. Further, the State would like the Department to make appointments online rather than through phone calls, where notifications would be received through a portal, but without sufficient access to the portal, this would create problems for both the clients and the Department. At some point, clients could be cut off from services.

Another example shared by staff is related to what is called Affirmatively Furthering Fair Housing, which focuses primarily on seniors and persons experiencing disabilities. Because these clients/tenants have insufficient online access, the Department still must employ many traditional methods -- inperson, mailing, faxing and others -- to ensure that services can be satisfactorily provided. In other words, because of digital inequity, the





Department has to employ other means of ensuring equity in the housing program.

- The three largest broadband-related challenges for aging individuals in the County are affordability, lack of access and unreliable access -- The cost of Internet access is a substantial barrier for the senior population in the County because many are on limited incomes (such as only having Social Security) and, even with discounted Internet services for seniors, may not have necessary funding to access it, if it is not free. Then, because of the other expenses that they have, if it is not reliable, the perceived cost/benefit is substantially reduced, and seniors will abandon the service all together.
- Aging individuals also are a population that struggles with technology literacy issues – This was described by discussion participants as complicating initial learning and sustained use, as well as inhibiting expansion of their skill set as technology changes and their ability to troubleshoot when there are problems. For example, some seniors can have difficulty resetting a router even though it is usually a simple operation to regain access.

One of the successful responses to this initiated by Social Services is to have assistance and training programs at senior centers. This has the added benefit of bringing seniors out of isolation (which also combats loneliness), and learning and accessing the Internet becomes a communal thing for a group with similar interests. Further, once online, there is a substantial senior community that works to assist, enable and empower fellow seniors. Accordingly, it can have a cascading effect if a senior can be attracted to communal initiatives in the first place.

Staff shared that there must be as many locations as feasible that seniors can reasonably transport themselves to, or have others transport them to, that provide this type of public, communal access. Social Services is aware that there needs to be more public access locations distributed throughout the County, because of the number of people (not just seniors) who, for example, sit outside the Social Services building to gain access to publicly available Internet through the Department's WiFi system.

• Getting vulnerable populations, the information that they need in a disaster situation is problematic – Social Services is responsible for sheltering in a disaster. Participants shared that this means getting information out to the Covered Populations that they serve, such as seniors, and making sure that they are okay, and that they are executing a preparedness plan for evacuation or another type of response. Because such populations may not have the connectivity, devices, or skill set that they need, it is concerning whether they will have the information they need to be safe in an emergency. For example, there are apps like Watch Duty that will alert you to a fire, but only





if you have connectivity, if you have a smart phone, if you have the app, if you know how to use it, etc.

One method of providing information in an area like Lake County is to utilize traditional radio. There is a local radio station, KPFC, which while it cannot be received uniformly throughout the County because of topographical challenges, does provide essential information for seniors.

It is essentially run by seniors for the benefit of the senior community. Like many other outreach mechanisms, it was described as one part of the solution.

 Social Services has a greater role in Lake County because of the lack of nonprofits that typically provide certain services -- In many communities that are more densely populated, there are nonprofits that provide many programs for Covered Populations. In Lake County, Social Services must fill certain roles with critical programs that aren't necessarily a Social Services function of other local governments.

Additionally, larger, more densely populated counties would also have, for example, a specific non-profit entity that provides Internet access technologies, technology assistance, access to grant funding to support training and educational initiatives, and other services, and work in tandem with the resources that local government agencies are able to provide.

• As adoption initiatives are established, it will be important to pair them with more Last Mile funding -- Social Services noted that, in many cases, infrastructure like cable modem-based broadband could be seemingly close by, but the cost just to bring it down the driveway or extend it another block is substantial. Areas mentioned, similar to those described in other interviews and focused discussions, include Clearlake Oaks, Lucerne and Spring Valley. Many areas along Highway 20 can have long stretches with no access at all.

One idea would be to train people ahead of infrastructure being deployed, so that they were ready to obtain and utilize services once provided. However, this can have the opposite effect of people gaining the skills but not having the access, and then being frustrated by the lack of having the ability to participate in online services.

Additionally, there are those that have physical challenges and are homebound, where increasing their digital skill set could provide tremendous benefits, but without access, the training doesn't have the effect and the impact that it needs to have.

As one participant indicated, figuring out a way to provide access to everyone is critical, because ideally they would be able to learn how to use it in the comfort of their home, reduce any technology fears they may have while





building a comfort level, and then be able to fully utilize it at their place of residence where they're going to need it the most.

M. Residential Sector

1. <u>Residential Broadband/Internet Access Service Adoption</u>

The California Public Utilities Commission (CPUC) collects broadband availability data and displays it on the <u>California Interactive Broadband Map</u> to provide Californians a means to look up broadband speeds and service providers in their area. Broadband adoption is defined as the percentage of residential fixed Internet access connections per total households with broadband deployment. Figure IV.1. below shows adoption rates in Lake County for those with minimum broadband speeds of 25 Mbps/3 Mbps.







Figure IV.1. CPUC 2021 Broadband Adoption at 25/3 in Lake County, California²⁵

As shown in Figure IV.1., broadband adoption rates in the County range from >20 percent to >80 percent. The lowest adoption rates of >20 percent ≤40 percent are in Nice, Upper Lake, Witter Springs, Cooper, Vann, Parramore Springs, Enterprise, Lakeport, Kelseyville, Glenview, Highland Springs, Caldwell Pines and in and around Howard Springs. The rest of the County has adoption rates of >40 percent to >80 percent.



²⁵ Lake County Broadband Map (arcgis.com) - use CPUC 2021 Broadband Adoption – Broadband Adoption at 25/3 Filter.

2. Residential Broadband and Adoption

Survey Instrument Development

In an effort to further understand the current status of broadband availability and adoption among specific populations in Lake County, who continue, including on a national level, to face challenges related to digital equity, the County conducted a definedarea residential telephone survey. The survey focused on certain areas of the County known to have low digital equity/high digital distress, as further discussed, and defined below. The survey was crafted to ascertain current broadband/Internet adoption, where broadband was unavailable, why broadband had or had not been adopted, the most critical service features identified by those that had adopted and if current training was adequate. If training was identified to be inadequate, the need for future potential training was tested.

It was designed to gather as much Internet/broadband adoption information as possible from the Covered Populations residing in these defined areas in Lake County. Specifically, demographics analyzed included²⁶:

- Persons who are 60 years of age or older,
- Veterans,
- Persons with disabilities,
- Members of a racial or ethnic minority group,
- Rural residents,
- Individuals with a language barrier, including those who are English learners or have low literacy levels, and
- Individuals living in households with incomes not exceeding 150 percent of the poverty level

A 40-question residential telephone survey was completed by 208 area residents using the Random Digit Dialing (RDD) method.²⁷ It was conducted by CBG Communications' team partner, ROS Research, LLC (ROS) and included both landlines and cellphones. Spanish language interviewers were made available as needed. The survey employed a methodology for respondents to best reflect the Study's Covered Population demographic groups of age, ethnicity, persons with disabilities, rural residents, English as a second language, and income levels for Lake County based on US Census Bureau data. The County provided public notice to County residents of the upcoming telephone survey to encourage participation.

²⁷ An additional 107 area residents completed an initial portion of the survey designed to screen out those that did not have a broadband availability or adoption-related problem. These 107 reported that they and other members of their household were able to complete all the Internet activities they needed and wanted, including video streaming and uploads.



²⁶ <u>https://www.census.gov/programs-surveys/community-resilience-estimates/partnerships/ntia/digital-equity.html</u>

The questions on the survey followed the lines of inquiry related to assessing the respondent's level of digital equity. Specifically, questions in the survey focused on the following subject areas:

- Availability of Internet/broadband access at their home
- Reasons for not subscribing to home Internet/broadband services
- Use of mobile hotspot to access home Internet/broadband services
- Their priority level for having home Internet/broadband services
- The devices in the home for Internet activities and ownership of those devices
- Whether their broadband service meets their current needs, and if it doesn't meet their current needs, why not
- Where they access Internet/broadband outside the home
- The most important aspects of home Internet/broadband services
- If assistance, education or training was needed to help with skills necessary to access and navigate the Internet
- What would be a reasonable price to pay for home Internet/broadband services

3. <u>Survey Sample Development and Methodology</u>

A defined-area survey sample was developed utilizing landline and wireless phone numbers from specific census tracts around the County.

In order to identify specific census tracts with digital equity challenges within Lake County, all of Lake County was analyzed for four household adoption metrics (broadband/Internet/computer/cellphone) as further described below. The Average Digital Equity Index Score for the entire County was a score of 100.

Specifically, the Digital Equity Index Score was calculated utilizing the first metric (1) the % of households with a desktop/laptop computer and the second metric (2) the % of households with a wireline broadband subscription to increase a census tracts digital equity score, and the third metric (3) the % of households with NO computer and the fourth metric (4) the % of households with "cell only" for their Internet subscription plan, were used to decrease the score.

Figure IV.2. below shows the map of the Digital Equity Index Scores in Lake County. The scores were then further divided into the following ranges for purposes of analysis.

VERY HIGH = score of 200 or more HIGH= between 110 and 200 MEDIUM = between 110 and 90 LOW= between 90 and 75 VERY LOW = below 75.







Figure IV.2. Digital Equity Index Score for Lake County Based on 2020 Census Data. 28

As shown in Figure IV.2, the Low and Very Low Digital Equity Index Scores in Lake County can be found in and around Clearlake, Glenhaven, Clearlake Oaks, Indian Valley Reservoir, Glenview, and Howard Springs. The Medium Digital Equity Index

²⁸ Lake County Broadband Map (arcgis.com) - Use Lake County Broadband Map – Select Digital Equity Index Filter. https://brandstrategy.maps.arcgis.com/apps/instant/sidebar/index.html?appid=0383dfc2b43040a69324260f80172a2c





areas of the County include Harbin Springs, Clearlake Highlands, Bartlett Springs, Lakeport, Kelseyville, Lucerne and Highland Springs.

Additionally, Purdue's study of high distress areas for digital equity was also considered as it too utilized the same four census-based adoption metrics to calculate the Purdue Digital Distress scores (the four metrics were weighted differently in the Purdue study compared to the ones utilized in the Digital Equity Score Index). Some of the Purdue-defined Digital Distress areas in the County overlapped with the identified Low-Digital Equity Index areas in the County, as shown in Figure IV.3. Figure IV.3. below also shows digital distress at the census tract level in the County. The Purdue overlay was utilized to quickly get a glance at spatial patterns of identified inequity and/or the level of digital distress based on the Purdue metrics evident in the census designated neighborhoods shown.²⁹



Low Moderate High Figure IV.3. Digital Distress Areas in Lake County from Purdue Study 2021

²⁹ <u>Digital Distress: What is it? – Purdue Center for Regional Development</u>




In all, 11 Census tracts in Lake County were identified as having digital equity challenges and/or a high digital stress and were used as the basis for the focused residential survey efforts.

Table IV.1. Census	Tracts For Focused Resident	ial Telephone Survey Sample

Scores	Census Tracts					
LOW EQUITY	6.01	6.02	8.01	8.02	11.01	
HIGH DISTRESS	5.01	7.02	7.03	7.04	10.00	12.00

A telephone sample (cellphone and landline) for the corresponding zip codes was ordered and every phone number in the sample in all 11 of the census tract areas of the County were called using Random Digit Dialing at least once and as many as 4 times.

Telephone calling ran from July 28, 2023, through August 11, 2023. Eighty-two percent (82%) of respondents were reached via their cell phones and 18% via their landlines.

The survey resulted in 208 completed interviews³⁰ across the identified Census tracts. In all, the calling resulted in respondents from 14³¹ of the County's 21 census tracts completing a telephone survey. The largest concentration was in and around Clearlake, Clearlake Oaks, Lower Lake and Kelseyville. Table IV.2. below shows the census tract distribution of the respondents.

Census	Responses	Percentage
Tract		
1.00	2	1%
10.00	25	12%
11.01	10	5%
12.00	24	12%
5.01	4	2%
6.01	7	3%
6.02	25	12%
7.02	8	4%
7.03	10	5%
7.04	6	3%
8.01	18	9%
8.01	60	29%
9.01	2	1%
9.02	7	3%

Table IV.2.: Census Tracts for all Survey Respondents

³¹ Some phone numbers in the sample overlapped into neighboring census tracts and those residents were also screened and data collected if they met the digital equity and distress criteria for participating in the focused telephone survey.



³⁰ See Footnote 28.

4. Overview of Survey Data

Some of the overall data collected from the residential telephone survey are summarized below. This data provides an insight into the attitudes, opinions, needs, interests and experiences of those who are experiencing the lowest digital equity in the County. These insights allow us to analyze and understand the digital distress and challenges experienced by these survey respondents in the County. The data from the defined area residential survey goes to support the growing amount of data collected throughout the County from local organizations, businesses and government agencies and continues to highlight the continuing digital distress that the County is experiencing as a whole through the lack of broadband and the unreliable Internet services used by residents, businesses and organizations.

Summarized Survey Data

- Regarding race and ethnicity, the sample was largely White (76%), followed by Hispanic/Latino (16%), Black/African American (3%) and the remaining identified as Asian, American Indian, and Biracial.
- When considering the key digital equity-related Covered Populations beyond race, the sample of underserved and unserved represented many household incomes in the poverty range with the majority of those providing household income data reporting earnings below \$50,000 annually (42%). It should be noted that only 51% of those responding to the survey chose to provide an annual household income range.
- Ten percent (10%) identified as Veterans and 13% indicated living with a disability.
- Of the households surveyed, 88% of the surveys were conducted in English and 12% were conducted in Spanish. Sixteen percent (16%) indicated speaking Spanish in the home and another 2% reported speaking another language other than English.
- On the key questions of Internet and broadband access, 89% indicated that they could access the Internet at home, but 73% of those indicated that the Internet was insufficient for everyone in the household to do all the Internet activities they needed and wanted to do, such as video streaming and uploading.
- Of the respondents who chose not to subscribe to home Internet, 34% had used or are currently using a mobile hot spot to access Internet services at home; and 53% indicated that their mobile phone was all they needed to access the Internet.
- Of those <u>that chose not to subscribe to home Internet service</u>, the key reasons were satisfaction with the access provided on their cell phone, the high cost of Internet or they didn't need or want Internet access.





- For those <u>without Internet access</u> at home, 83% described getting access as a low priority.
- Of those with Internet service, the majority had wireline broadband (37%), 25% had fixed wireless, 14% had satellite broadband and 23% had DSL.

5. <u>Unserved Households</u>

To better understand the residents that are unserved (no access to internet services at home) in low digital equity areas, we were able to reach 24 households that do not currently have access to Internet services. The majority of these respondents (71%) indicated that they lived in and around Clearlake and Kelseyville.

When looking closer at this group's insights and opinions regarding Internet and broadband in the County, we identified the following characteristics:

- Eighty-three percent (83%) of respondents with no access to home Internet/broadband indicated that having Internet/broadband in their homes was a low priority.
- When asked how much they would consider a reasonable cost to pay for home Internet services per month, a majority of those (63%) said that it should be free.
- Those with no Internet service available to them were also asked if home Internet/broadband services were available for free in their home, would they use the service. Forty-two percent (42%) said they didn't know if they would use it, 29% said they would get it and another 29% said they would not get the free Internet/broadband service.
 - When this group was asked why they would not get the free service, a variety of answers were shared, including:
 - I prefer to spend quality time with friends and family.
 - Because I don't like to be plugged-in.
 - I'd rather be outside with my family playing games and sports.
 - I do not need it.
 - My landline phone is enough.
 - I am old, I do not need it.
 - We are an old and retired couple, and we prefer to spend quality time with our friends and family instead.
- These same respondents were asked if they had devices in the home for Internet activities. Eighty-three percent (83%) indicated that they had a device,





and one indicated that they did not have a device in the home. Fifty percent (50%) also indicated that they did not need or use the Internet.

- When probed further as to why the respondents did not need or use the Internet, a variety of responses were provided, including:
 - I'm old and retired, I do not use the Internet.
 - I'm old and sick, I do not need it for anything.
 - Because I prefer to spend quality time with families .
 - I can call everyone I want to talk to and do not need the Internet to reach them
 - I do not want to pay for something I do not really need.
 - We are old and retired and we don't use the Internet.
 - We are old and we don't need the Internet.
 - We are retired and if we need anything that is related to the Internet our children help us.
 - We are retired and we don't use the Internet but when we do, we ask our children
 - We are retired and we don't use the Internet.
- To further understand this group of respondents with no access to the Internet at home, we asked if they used the Internet outside of the home and 29% (N=7) indicated that they did.
- Respondents with no access to the Internet were asked where they used the Internet outside the home and a variety of locations were mentioned, including: work, school, friend's and family's homes, free Internet in public places, local businesses, and other organizations.
- Only 37.5% of those without access to the Internet were aware of a low-cost Internet service.
- Twenty-nine percent (29%) of these respondents indicated that they depend on others to help them with the skills necessary to access and navigate the Internet and only two respondents indicated that they would like education or training to help them use the Internet effectively.

When this group was asked if there was anything else they would like to share with the County about Internet and broadband, they all said no.

This group of respondents that have no access to Internet/broadband where they live were primarily:

- Seniors, with 67 being the average age.
- One in four were living with a disability.
- Two in ten were from Hispanic households.





- Two out of three owned their own home.
- Four out of five have no children living in the home.
- Seven out of ten were retired.
- Nine out of ten have less than an Associate's degree.
- Almost half reported an annual income under the poverty level.

6. <u>Unadopted Households</u>

Residents in our sample who had access to Internet/broadband services at their home were asked if they subscribed to those services. Forty-seven (47) of the survey respondents reached by telephone indicated that home Internet/broadband access was available, but they did not subscribe. The majority of these respondents (77%) indicated that they lived in and around Clearlake, Highland Springs and Glenhaven.

To further understand why these respondents with available home Internet/broadband services did not adopt such services, we asked them a variety of questions to understand their opinions and behaviors. The following is a summary of those responses.

- Respondents who chose not to subscribe to available home Internet/broadband services were asked if they had ever subscribed to the services in the past. Over one in four indicated that they had.
- One in three said they use or have used a mobile hotspot for access to the Internet at home.
- All respondents in this group were asked why they did not have a home Internet subscription, and more than half of these respondents indicated that their cellphone was all they needed.
- Respondents in this group were asked if cost was an issue for not subscribing to the home Internet/broadband service and one in three indicated it was.
- Respondents in this group were asked what the priority level was for having home Internet/ broadband services and more than one in three indicated that it was a low priority.
- Respondents in this group were asked what they considered a reasonable cost to pay for home Internet/broadband services, per month, at their home, and \$30 was the most common answer provided with around 1 in five indicating it should be free.
- Respondents in this group were also asked if home Internet/broadband services were available for free at their home, would they use them? More than three in four respondents indicated that they would.





- Respondents in this group were also asked if they had devices in the home for accessing the Internet and almost all respondents reported having a device for accessing the Internet in their home.
- To better understand this group's use of the Internet outside the home, all respondents were asked to tell us where they accessed the Internet outside the home. Almost two out of three respondents indicated that they used the Internet outside the home and the most common places mentioned were work and a local business.
- These respondents were also asked if they were aware of the low-cost Internet service for qualified low-income households called the Affordable Connectivity Program and almost three in five of respondents were not aware of this program.
- All respondents in this group were also asked how important certain Internet connection characteristics were. "Reliability" and "security and privacy" were indicated as the most important.
- The majority of this group did not need help using the Internet, but for those who did (1in 4), the people they sought out for assistance included: someone else in the household and neighbors and friends.

All respondents in this group were asked if there was anything else that the respondents wanted to share with the County related to Internet and broadband and four respondents provide the following comments:

- Better service and accessibility to more options for Internet service providers. But I do not want anyone to put up big 5G cell towers.
- We need more Internet services in Lake County
- We need accessible and affordable Internet
- We need options to be able to get Internet that is reliable at a fair price.

When looking closer at this group of respondents who have access to Internet at their home, but have chosen not to subscribe to home Internet services, we find the following characteristics:

- They range in age from 27 to 90 years old with 48.7 being the average age.
- One in four is living with a disability.
- Two out of three are from white households.
- Two in five either own their own home or rent.
- More than half are women.
- Four in five do not have children under 18 in the home.
- Two in five are working full-time and one in three are retired.
- Two in three have less than an Associate's degree.



When asked to provide an income range, almost half (45%) preferred not to answer this question, Of the remaining who did provide their income range, more than one in four (28%) reported incomes in the poverty range.

7. Households with Insufficient Internet/Broadband Subscriptions

Residents in our sample who had access to Internet/broadband services at their home were asked if they subscribed to those services and if everyone in their household could do all the Internet activities they needed and wanted. One hundred and thirty-seven (137) survey respondents indicated that they have home Internet, but that they <u>could not</u> do all the daily Internet activities they needed and wanted. The majority of these respondents (72%) that we reached by telephone indicated that they lived in and around Clearlake, Lower Lake, Glenhaven, and Highland Springs.

To further understand the barriers <u>this group of respondents</u> experienced with their home Internet/broadband services, a variety of questions were asked. The following is a summary of those responses.

• These survey respondents were asked to describe the daily Internet activities they could not do with their current home Internet services. The following is an aggregated list of categories developed from the responses provided, including the reasons why respondents couldn't do the daily activities that they wanted to over the Internet.

Daily Internet Activities Respondents Can't Perform with Their Current Internet Service.

- 1. Anything over the Internet (64%)
- 2. Streaming Services (27%)
- 3. Uploads and Downloads (4%)
- 4. Gaming (3%)
- 5. Video Calls/Virtual Meetings (3%)

Reasons Why Daily Internet Activities Can't be Performed.

- 1. Unreliable Internet/Goes Out/Drops (63%)
- 2. Speed Slows Down/Speed is too Slow (41%)
- 3. Weak Signal (5%)
- 4. Cost/What I can Afford (2%)





The Wordle below clearly illustrates the most common words reported in the survey by respondents who had insufficient Internet service related to Why Daily Internet Activities Could Not Be Performed. The Wordle shows the most repeated words in the largest font and the least reported words in smaller size font.



Picture IV.1. Depicted Above are the Narrative Survey Responses in a Wordle.

• These same respondents were asked to describe their home Internet service subscription and indicate all that apply. Table IV.3. below shows the different subscriptions reported.

Table IV.3. Type of Home Internet Services

Type of Internet	Responses	Percentage
Broadband via cable	50	37%
Mobile/cellular broadband	2	2%
Mobile hotspot	0	0%
Fixed Wireless	35	26%
Public/Community WiFi	0	0%
Satellite	19	14%
DSL	32	23%
I Don't Know	3	2%





- All respondents with a home Internet subscription were asked how much they currently paid, per month, for their home Internet services. Fifteen percent indicated that they didn't know. For those who did respond, the amount paid per month ranged from zero to \$250. The average amount paid was \$96.85 and the most common amount paid was \$100.
- All respondents with a home Internet subscription were also asked what they would consider to be a reasonable cost to pay per month for home Internet services. Twelve percent indicated that they didn't know and another 12% indicated that home Internet should be free. The other respondents provided a cost range of what they believed was reasonable from \$20 \$145 with the average reported being \$50.
- All respondents with a home Internet subscription were asked about the main barriers to them for having sufficient and reliable Internet access in their home. Table IV.4. below shows the Categories of main barriers and the responses provided.

Type of Barrier	Responses	Percentage
No availability	2	2%
Affordability / Cost	27	20%
Insufficient access (slow speeds, unreliable)	122	89%
Accessibility	1	1%
None	12	9%

Table IV.4. Types of Barriers Experienced by Respondents (N=137)

- All respondents with a home Internet subscription were asked what devices they had in their home for access to the Internet. All respondents indicated having at least one device at their home. The most common reported device was a smartphone or cellphone (96%). This was followed by laptop computer (86%) and tablet/Chromebook (58%).
- All respondents with a home Internet subscription were asked if the devices they had were provided to them by another entity. Eight respondents indicated that their devices were provided to them by their work, school and/or a friend or family member.
- All respondents with a home Internet subscription were asked if they use the Internet outside of their home and more than one in four (27%) indicated that they did not. Those who indicated that they accessed the Internet outside the home were asked where they used the Internet. Half of respondents indicated accessing the Internet at their place of work. This was followed by access at a local business (i.e., restaurant or coffee shop) (23%), and the home of friends and family (22%).
- All respondents with a home Internet subscription were asked if they had applied for and/or are aware of the low-cost Internet service program for qualified low-income households called the Affordable Connectivity Program.



Seven in ten indicated that they were not aware of this program. One in three indicated that they were aware of the program but don't use it. One in ten indicated that they don't qualify for it.

 All respondents with a home Internet subscription were also asked to rate several characteristics of their Internet connection and report how important each characteristic was to them. Reliability scored the highest in Importance with 96% reporting Reliability as Very Important. This was followed by Fast Speed with almost 9 in 10 reporting Fast Speed as Very Important. Table IV.5 below delineates those responses.

Characteristic	Very		Somewhat	Not at All
	Important	Important	Important	Important
Internet Connection	85%	13%	2%	0%
Fast Speed	89%	10%	2%	0%
Unlimited or Plentiful Data	68%	23%	8%	1%
Reliability	96%	4%	1%	0%
Security and privacy	88%	11%	1%	0%
Cost	77%	18%	4%	1%

Table IV.5. Importance of Internet/Broadband Characteristics (N=137)

- All respondents with a home Internet subscription were also asked whether they depended on other people to help them with the skills necessary to access and navigate the Internet and almost 2 in 5 respondents reported that they did. Of those that needed help using the Internet, the people that they sought help from most were someone else in the household and a neighbor, friend or family member.
- All respondents with a home Internet subscription were asked if there was any kind of education or training that they needed to use the Internet effectively. The majority said they did not need any education or training (96%).

Those that did want training indicated that computer hardware troubleshooting or mobile device troubleshooting training was needed, and education regarding protecting themselves and their data online was needed.

All respondents in this group were asked if there was anything else that they wanted to share with the County related to Internet and broadband. A majority said they had nothing additional to add, but nine (9) respondents provided the following final comments:

- Somewhat poor services.
- Poor Internet upgradation (e.g., my upgrade is poor too).
- Our infrastructure is outdated and cannot support our needs. I have to pay for the highest tier of Internet to get DSL speeds. Anything cheaper does not even allow me to use the phone.





- Not enough affordable Internet services.
- The County should have more choices to choose from.
- I wish there were more competition.
- With the ACP program, the Government promised faster and reliable Internet and I don't have either.
- Rural Internet is essential for our citizens to be able to participate in society.
- I would like them to get faster Internet for everyone, and it should be affordable too.

When looking closer at this group of respondents who have access to Internet at their home, and have chosen to subscribe to home Internet/broadband services, we find the following characteristics:

- They range in age from 21 to 82 years old with 54 being the average age.
- Ten percent (10%) reported being a veteran.
- One in five is living with a disability.
- Four in five are white households and 16% are self-reported from Hispanic households.
- Two in three own their own home.
- More than half are men.
- Seven in ten do not have children under 18 in the home.
- Almost half are working full-time and one in three are retired.
- Almost half have less than an Associate's degree.
- When asked to provide an income range, almost half (45%) preferred not to answer this question. Of the remaining who did provide an annual income range, 12% reported incomes in the poverty range, 12% reported a range of \$35,000 to less than \$50,000, 12% reported a range of \$50,000 to less than \$75,000, and 12% reported incomes greater than \$75,000.

8. <u>Residential Survey Covered Population Community Analysis</u>

Analysis is currently being performed to further evaluate broadband adoption of survey respondents in relation to the Federal and State Programs promoting Digital Inclusion and Equity for all individuals and communities. Specifically, the characteristics of Covered Populations that the State and Federal Programs are focused on to help with adoption and use of broadband services are being reviewed versus the likely guidelines for obtaining associated funding from these Programs. A summary of those characteristics, opinions and thoughts related to Internet/broadband for those Lake County populations will be presented in the upcoming Broadband Implementation Plan.





V. UPDATED POLICY RECOMMENDATIONS

A. Overall Policy Issues and Considerations

Many of the policy issues, considerations and recommendations provided in the 2019 Plan continue to be important in 2023. As such the County should continue to enhance, pursue and implement those, as feasible, in order to help foster both expanded and enhanced broadband deployment and adoption in Lake County. Specifically, policy continuance, pursuit, implementation and enhancement should continue in the following areas:

1. Streamlining Broadband Deployment

Consistent with the 2019 Plan, it's important for both the County and the incorporated municipalities to review and implement ways to streamline broadband infrastructure deployment, such that broadband deployment in unserved and underserved areas of Lake County could be accelerated and services provided more cost effectively. Specifically, local governments' permitting of the use of the rights-of-way (ROW) should be streamlined concerning both the permit application and issuance process to reduce administrative burdens on both the local government and the provider, as well as shorten the process as much as feasible. This typically requires extensive coordination with providers on their plans and schedule, as well as for large projects, implementation of processes such as blanket permitting.

Everything that can be done to streamline governmental processes related to deploying broadband by ISPs should be considered. Tying up projects in the permit stages can potentially lead to lost revenues by ISPs and in some cases, motivate them to expand their networks in what they perceive as jurisdictions with more streamlined processes.

Additionally, as explained further below, our understanding is the County and the incorporated municipalities have considered Dig-Once policies and should now move to implement these as soon as feasible. For County and municipal paving projects, although budget constraints may restrict the amount of such work that is getting performed on an annual basis, any work that opens the ROW that coincides with intended deployment by providers, should be coordinated where practical to reduce cost, and expand deployment more quickly. Coordination with other utilities, such as PG&E, is also important to see if there would be joint trench opportunities in these cases too. The positive impacts of these types of implementations, as well as the implementation of micro trenching (requiring a much less invasive installation than traditional trenching), are explained in further detail below.





2. Establishing Priorities for Deployment

As noted in Section III, the County and providers are already reviewing priority areas for implementation related to time-sensitive grant application processes. This work will continue through the Implementation Plan phase of the overall broadband enhancement and expansion project in Lake County.

Going forward, based on the recommendations delineated in the next Section VI of the Plan Update, continual, active efforts to work with providers, policy makers, sector representatives, businesses and the residential community will be extremely important in the near term related to successfully pursuing upcoming funding opportunities. In the longer term, such efforts will be needed to work to provide uniform broadband availability throughout the County and expand opportunities for all members of Lake County's population to adopt broadband service and make effective use of the Internet and online services.

3. Establishing and Maintaining Partnerships

As the County has already seen, working in partnership with providers is not only effective in getting them engaged in accelerating broadband deployment, but also enables the County to help steer deployment where the County believes it's most needed, based on a variety of public interest considerations. These types of partnerships can take a variety of forms including, for example:

- a. Letters of support for particular projects, especially as such may be beneficial for obtaining grants, loans, loan guarantees or other forms of support from both public and private sources;
- b. An Agreement in Principle, designed to chart paths forward with formal responsibilities to be identified later, once funding for the deployment project is received;
- c. A Memorandum of Understanding establishing roles and responsibilities for at least supporting funding applications; or
- d. A full Public/Private Partnership (3P) that would have the County or municipality take on formal infrastructure/service management, operational or other responsibilities. This type of partnership would only be implemented typically if the County established some ownership, operational or formal affiliation role with the ISP.³²

All of these should be under consideration as they become applicable in the future related to broadband expansion and enhancement opportunities.

³² An affiliation agreement, however, can be as simple as the local government working formally with the ISP to help provide outreach through its agencies and nonprofit partners to expand awareness and increase take rates related to affordable connectivity programs, such as the Federal ACP.





4. <u>Continue Working on Both the Regional and State Level to Affect</u> <u>Beneficial Public Policies Related to Broadband Deployment and</u> <u>Adoption for Lake County</u>

The County continues to be an active member of the Upstate California Connect Consortium (UCCC) and the RCRC/GSCA. The updated information gathered and reported herein shows how many sectors work on a regional basis to be successful and provide products and services to their Lake County clients and constituencies. Some ISPs work on a regional basis as well, and their work in other areas can have benefits for deployment of infrastructure and services in Lake County.

On the State level, the CPUC, while it is continuing to implement the FFA and CASF programs, evaluate applications and make awards, it is also implementing the California portion of the Federal government's Broadband Equity, Access and Deployment (BEAD) Program. Specifically, California has been allocated approximately \$1.86 billion under the various grant programs that are part of BEAD. Especially when it comes to broadband deployment, the CPUC will be the recipient of, and administering agent for, the BEAD Program. The California Department of Technology (CDT) will serve as the recipient of, and administering agent for, the State's Digital Equity Plan.

The State, as of the date of this Updated Plan, issued a BEAD Rulemaking³³ and on August 27, 2023 submitted its 5 Year Action Plan to the NTIA.³⁴ This Plan describes the planning activities and actions that the State has already taken concerning the implementation of its BEAD funding allocation, and the public comment and information gathering activities that the CPUC will continue to engage in, until it anticipates issuance of its Initial Proposal for program rules regarding the BEAD proceeding (currently anticipated prior to the end of October 2023). The CPUC will then take into account all the comments and input that is received related to these information gathering activities into the final version of its Initial Proposal due to the NTIA by December 31, 2023.

The CPUC anticipates that it will begin distributing funding pursuant to the final BEAD funding application process determined, around mid-2024.

Based on all of this, it will be very important, from now through the Fall of 2023, that Lake County and other interested stakeholders actively participate in the comment process.

³⁴ See State of California Five-Year Action Plan - Broadband Equity, Access and Deployment (BEAD) Program, dated August 28, 2023, California Public Utilities Commission.





³³ See R.23-02-016.

5. <u>Work with Stakeholders to Apply For and Obtain Funding for Both</u> <u>Broadband Deployment and Adoption-Spurring Efforts</u>

Once the rules are set, Lake County, providers, and providers in conjunction with Lake County, will be able to apply for deployment funding under the BEAD Program. It is anticipated that the process may be very similar to the FFA application and grant distribution process. Accordingly, just as the County has been actively involved in helping identify areas of need and working with providers to fill those areas of need under the FFA, it should be prepared to continue those efforts under the CPUC's implementation of the BEAD Program.

Additionally, the County and multiple interested stakeholders related to adoptionspurring efforts should continue active involvement in and be prepared to work with partners to apply for Digital Equity and Inclusion-related grants under BEAD, administered by the CDT. Also, the NTIA will make some Digital Equity funds directly accessible by local governments, without going through State processes. The County, and allied stakeholders, should pursue funds through these processes as well.

Other grant opportunities to be aware of include:

- a. **USDA Reconnect Grants --** These grants are for ISPs and are focused on rural areas. There are multiple funding categories including:
 - 1. 100% grant;
 - 2. 100% loan;
 - 3. 50/50 loan/grant combination;
 - 4. 100% grant for Tribal governments, poverty areas and socially vulnerable communities; and
 - 5. Projects serving areas where 90% of households lack sufficient access to broadband.

The latest round of funding for FY 2023 was \$1.44 billion awarded across 74 projects. It is anticipated that there will be additional funding added to the Reconnect Program in FY 2024.

- b. **USEDA --** The USEDA has a variety of grant programs which can include a broadband component if it facilitates the ultimate goal of enhanced economic development in an area. This includes grants focused on:
 - 1. Economic adjustment assistance;
 - 2. Disaster recovery;
 - 3. Public works; and
 - 4. Regional technology and innovation hubs -- the application period for FY 2023 has closed, but it is anticipated that Congress will allocate additional funding for FY 2024. This grant requires development of a Regional Consortium (Consortium) that can include various





combinations of academia, private sector, government, Federal institutions and others to focus on a variety of science and technology areas, which can include advanced communications technologies. One of the intriguing elements of the program is that the Consortium developed can include assets or members outside the chosen geography, including allied organizations in non-metro rural areas working with other Consortium members in metropolitan areas.

Overall, it will be important to review any relevant funding opportunities from the USEDA as they become available, because economic development is a critical focus for Lake County overall.

6. Promotion of Adoption-Spurring Mechanisms

The information gathered as part of the Updated Plan indicates some significant inhibitors to adoption of broadband where it's available and, where it's currently unavailable, even if it were to become available in those areas. This means that it will be important for the County and associated stakeholders to pursue broadband adoptionspurring methods and mechanisms on multiple fronts. For example, it will be important to:

- a. **Expand free public WiFi** -- There are efforts already underway to expand free publicly-available WiFi in and around government facilities, public parks and other public gathering places. It will be important for Lake County, its municipalities and their agencies to work with ISPs and vendors and, as it may be feasible budgetarily, to utilize their own Internet access backhaul, partition it, and then provide access to publicly-available WiFi. It was notable that many residential respondents to the Survey are only inclined to use broadband/Internet if it's free. This same observation was relayed anecdotally from agencies that serve a multiplicity of the Covered Populations.
- b. **Education and training --** Another notable adoption-inhibiting issue is lack of a fundamental level of education and training, especially when it comes to technical assistance. This is why "Tech Tuesdays" have become popular at the Library. These kinds of programs act to counteract both reluctance to adopt, and frustration with problems with existing services, which then leads to non-adoption or abandonment of adoption efforts.
- c. Affordable Connectivity Program -- Affordability is found to be a substantial broadband adoption inhibitor in Lake County, and there are programs in place to reduce costs, both directly from private providers and also through the Federal and State ACP programs. Information obtained from organizational stakeholders as well as from individual residents indicates that many residents are not aware of the program, including how to qualify for it and how to access it. It will be important to expand outreach





efforts concerning these programs, advocate at the State and Federal levels for their continuance, work with providers to ensure that all in their coverage area are aware of the programs and monitor participation to bolster successful outreach efforts and modify less successful outreach.

- d. **Device Access** -- Evidence indicates that Internet access device provision programs for use at home, as well as hotspots provided to facilitate Internet access at home, have been helpful in increasing use of the Internet and online services for many in Lake County. However, funding support for these programs has either dissolved or is going away. It will be important to find ways to continue to support these programs until other types of programs providing more permanent broadband connections and owned devices can be implemented.
 - B. <u>Policies, Processes and Procedures to Help Facilitate Broadband</u> <u>Infrastructure Deployment</u>

The following subsection describes four specific policies and procedures that, if implemented, have been shown to help accelerate deployment of broadband infrastructure and services.

1. Dig-Once Policy

Dig-Once policies can provide significant savings for future placement of telecommunications infrastructure. We concur with the general Dig-Once Policy recommendations proposed in the 2019 Plan, and further note that it is important to keep practicality in mind. Specifically, in order for Dig-Once policies to be fruitful, realistic requirements must be in place that define when the policies apply and when they do not. For example, requiring placement of conduits in a trench that is only 50-100 feet long in the middle of a street, may not have any future practicality. However, when a 4-foot-deep trench is going to be opened over a path of hundreds or several thousand feet, such as the recent project shown below, having conduit put in place can mean the difference between an area being served and being too costly for broadband deployment.

Moreover, as the example below is 2,000 feet in Spring Valley, cost effectively placing conduit can be the difference of new fiber optic cables being placed underground (hardened against wildfires) versus being built on existing poles (not hardened).













Quail Trail Water Line Replacement Project

Summary

SCH Number	2020120256
Public Agency	Lake County
Document Title	Quail Trail Water Line Replacement Project
Document Type	NOE - Notice of Exemption
Received	12/15/2020
Posted	12/15/2020
Present Land Use	Existing water system
Document Description	The project proposes to replace 2,000-feet of water line with a 6-inch diameter C-900 water line, which will meet fire capacity standards. The trenching for the replacement water line will be 4 feet deep and approximately 18-24 inches wide. There will be no disturbance beyond the existing County Right of Way for the replacement of the water line. The water line replacement will serve 22 residents along Quail Trail in the community of Spring Valley.

Picture V.II. Quail Trail Water Line Replacement Project Description.





2. <u>Micro-Trenching Policy</u>

Micro-Trenching is a technique of cutting a relatively small trench, usually under 2 inches wide and less than 18 inches deep and placing one or more small, flexible conduits into the trench. Micro-Trenching is attractive to network operators for its relatively low costs, quicker processes and faster network infrastructure deployment; therefore, enabling faster speed to market with communication services.

To determine the practicality of employing Micro-Trenching in Lake County, civil and structural engineers that are familiar with the local conditions should determine:

- 1. The minimum and maximum depths for Micro-Trenching.
- 2. The proper width of the trench and how earthquake considerations may impact that.
- 3. The proper fill below the conduits, if the soil(s) are porous with sharp gravel or are otherwise potentially harmful to conduits and fiber optic cables.
- 4. Proper backfill depths and materials such as sand above the conduits and below the sealant.
- 5. Proper sealant type and depth at roadway/sidewalk surfaces.
- 6. Maximum variance of the finished trench's surface to the existing roadway or sidewalk. This is about minimizing the tripping risk as well as the impact created by traffic crossing over uneven surfaces.
- 7. Specifications of how far from the normal tire paths on roadways the trench must be and the distance from the edge of the road or curb the trench should be. Locating the trench in such a way as to minimize traffic contacting the top of the trench is most desirable.

Los Angeles County, for example, has developed well defined standards for Micro-Trenching, as documented in its Micro-Trenching Standard Plan³⁵

3. Conduit Specifications for Dig-Once and Excess Conduit Applications

Requiring conduit specifications at a governmental level is a sound practice as it relates to Dig-Once or joint trench project requirements where the conduit in question may be utilized by a third party not involved in the placement of the spare or excess conduit.

Conduit specifications that include requirements and recommendations such as size, type and material of the conduit, conduit installation and placement in the trench parameters, depth and distance from utility infrastructure, vault installation parameters, and minimum distance between vaults or manholes, among others can be included in a Dig-Once policy where additional spare or excess conduits are being placed. These specifications must be reviewed by Public Works departments to assess feasibility and

³⁵ <u>https://pw.lacounty.gov/ldd/lib/forms/Guidelines/Road/1050-0%20Micro-Trenching 3-21-2022%20-%20Signed%20Copy.pdf</u>





practicality of such installations in specific geographic areas.

4. Master Lease Agreement

CBG concurs with the Master Lease Agreement as detailed in the 2019 Plan to the extent it provides efficiency to the County's development of agreements with ISPs to utilize County facilities and ROW. The recommendation in the 2019 Plan is as follows:

"The purpose of this lease agreement is to reduce processing time and the complexity of leasing a local government's broadband-related assets. A lease agreement allows for the installation, operation and maintenance of ISPs' telecommunications equipment on city-owned assets. To maximize effectiveness of a master lease agreement, the local government needs an up-to-date inventory of assets, which might include land, public rights-of-way, conduit, buildings, utility poles, light standards, towers, and any other property on which wireless, or wireline broadband infrastructure could be located. For example, base stations can be installed atop municipal buildings or towers, and/or fiber-optic cable can be rolled out in underground conduit or utility poles. This inventory should be publicly available for ISPs to review so they can assess the assets they may want to lease, based on their broadband deployment planning. The agreement should include fee structures, agreement duration, renewal terms, access and responsibilities of the parties, and co-location rights, among other legal requirements."





VI. <u>RECOMMENDED ACTIONS, INITIATIVES AND STRATEGIC</u> <u>DIRECTIONS FOR EXPANDED AND ENHANCED BROADBAND</u> <u>INFRASTRUCTURE AND SERVICES IN LAKE COUNTY</u>

Based on review and analysis of all the updated information gathered, we recommend the following actions, initiatives and strategies be pursued and reflected in the upcoming Implementation Plan. The Implementation Plan will further detail timelines, projected costs, metrics for measuring success and other elements needed to successfully implement the recommendations listed below:

A. <u>Pursue deployment of broadband infrastructure and services to ensure that</u> <u>all Community Anchor Institutions (CAIs) have available access to Internet</u> <u>connectivity at 1 Gbps</u>

CAIs, such as government facilities, educational facilities, libraries, healthcare facilities and other essential community sites, are critical to the provision of multiple services throughout any community, including Lake County. As such, they need the capability, even if they don't need to use it initially, to have high-capacity symmetrical broadband Internet connectivity.

Additionally, if deployment of such 1 Gbps service is structured properly, the infrastructure developed can be further utilized to expand and enhance broadband for residents and businesses along the route.

B. <u>Implement Right-of-Way (ROW) management processes and procedures</u> to help accelerate cost-effective broadband deployment

Where practical, these processes and procedures should, for example, include:

- 1. Streamlined permitting processes.
- 2. Expanded coordination concerning ROW management projects, such as road construction and paving, with broadband providers and other utilities to seek the most cost-effective and timely infrastructure deployment.
- 3. Employ micro-trenching where feasible.
- 4. Implement and promote Dig-Once policies. Also, develop policies to encourage providers to drop in common/excess/spare conduit to ensure capacity for future expansion without once again trenching in the ROW.
- 5. Consistent with the 2019 Plan, develop favorable lease terms for access by providers to government vertical assets such as towers, buildings and streetlights. Wherever wireless broadband deployment is anticipated, work with providers to utilize the assets for the widest possible expansion of broadband services.



- 6. Require pre-wiring of business and residential structures in all new housing and commercial developments, including installing conduit to the curb or entrance to the development to encourage ease of access by providers.
 - C. <u>Develop partnerships, and otherwise work closely, with the broadband</u> provider community

Work with providers to prioritize broadband deployment to the numerous pockets of residential and business locations that only have access to sub-broadband service, and work jointly to obtain available grant and loan support to facilitate deployment to those pockets. Additionally:

- 1. Support development of Open Access Networks (OANs), where feasible, to facilitate use by multiple ISPs, especially of expanded Middle Mile infrastructure.
- 2. Work with both wireless and wireline providers to ensure the greatest coverage at the highest broadband capacity throughout the County.
 - D. Work with Tribal Nations in the Lake County area to find synergistic ways to build upon both the County's and the Tribal Nations broadband deployment efforts

The Tribal Nations are very active in the surrounding community, and as such, broadband expansion for the Tribes and the County benefits both. Where feasible, coordination will serve to enhance each entity's efforts.

E. <u>Work on a regional basis for the benefit of Lake County constituencies</u>

Because a significant portion of economic development, service provision to residents and deployment by the broadband provider community, occurs on a regional basis, continue to pursue regional efforts that will help expand and enhance access in Lake County and throughout the region. Work with entities such as the UCCC and others in order to promote efficiency and the greatest access to grants and other funding and resources that may be provided on a regional basis.

F. Stay active in advocacy on a State and Federal level

Because actions at the State and Federal levels have substantial impacts on the potential for expanded and enhanced broadband infrastructure and services in Lake County, it's important for Lake County and its stakeholders to be heard in order to affect public policy that in turn affects them.

Also, such advocacy efforts will ultimately lead to the ability to obtain support funding, both for the provider community directly or in conjunction with Lake County



regarding broadband deployment, and for Lake County and its stakeholders regarding broadband adoption.

G. <u>Work with the provider community to improve the reliability and resiliency of their systems</u>

Information gathered indicates that there are reliability issues with existing systems that create problems with access to the Internet in general and to specific online services. This appears to be related to inconsistent powering of the systems, as well as infrastructure maintenance issues and, in some cases, the number of support personnel. Any partnerships with the provider community should include commitments to enhance reliability of the infrastructure that will be jointly promoted for funding support and deployment.

Beyond this, it will be important for providers to build redundant and resilient systems where feasible. This includes providing multiple communications avenues for outreach to residents and businesses during an emergency. Such multiple redundant and resilient systems would significantly benefit Lake County and all of its constituencies, certainly in the case of wildfires and other emergency situations.

Work with providers to harden their infrastructure as feasible to ensure its sustainability, especially related to new infrastructure and service deployment.

H. Expand public access to the Internet

This should include, at a minimum:

- 1. Continuing the development of public WiFi throughout Lake County and the incorporated municipalities, and
- 2. Seeking funding and other resources to enable continuation of provision of hot-spots and Internet access devices.
 - I. Expand adoption-spurring efforts

This should include, at a minimum:

- 1. Promoting affordable access to the Internet, including promotion of programs like ACP and any other low or no-cost Internet services, especially as they relate to the Covered Populations.
- 2. Continuing and expanding education and training activities at libraries, schools, nonprofit organizations and other locations convenient to Covered Populations who may have limited transportation or other issues that keep them from going to centralized locations.



J. <u>Continue outreach to the entire Lake County Community regarding</u> <u>broadband planning efforts</u>

Community engagement concerning the broadband-related experiences, issues and needs of the County's constituencies should be a continual activity that works to assess increases in availability and adoption based on metrics to be established.





VII. <u>CONCLUSION</u>

Based on all the broadband availability and adoption information reviewed and analyzed, including, but not limited to: the latest from the CPUC, FCC, NTIA and other State and Federal government agencies; information from multiple stakeholder agencies and organizations; information from Tribal Nations; information from the business and residential communities, and the incorporated municipalities, the Lake County Master Broadband Plan prepared in 2019 has been updated to reflect the sea change in the broadband infrastructure, service and adoption environment in 2023.

Much of the data determined has been incorporated into a multi-layer, interactive broadband map which can be found at:

https://brandstrategy.maps.arcgis.com/apps/instant/sidebar/index.html?appid=0383dfc2 b43040a69324260f80172a2c

The recommended actions, initiatives and strategies for expanded and enhanced broadband implementation in Lake County derived from all the information reviewed and analyzed serves as a solid foundation for moving forward with the next phase of the project, development of the Lake County Broadband Implementation Plan.





VIII. <u>APPENDICES</u>

APPENDIX A – Community Anchor Institutions

Appendix A Community Anchor Institutions							
Institution Name	Address	Current Internet/ Network Provider	Forward Speed	Return Speed	ls a Plan With Higher Speeds Available?		
Kelseyville Unified School District Office	4410 Konocti Rd	AT&T	1 Gbps	1 Gbps	Yes		
Kelseyville Alternate Education	4410 Konocti Rd	AT&T	1 Gbps	1 Gbps	Yes		
Kelseyville Elementary School (K-5)	5065 Konocti Rd	AT&T	1 Gbps	1 Gbps	Yes		
Kelseyville High School (9-12)	5480 Main St	AT&T	1 Gbps	1 Gbps	Yes		
Kelseyville Learning Academy	4410 Konocti Rd	AT&T	1 Gbps	1 Gbps	Yes		
Mt. Vista Middle School (6-8)	5081 Konocti Rd	AT&T	1 Gbps	1 Gbps	Yes		
Riviera Elementary School (K-5)	10505 Fairway Drive	AT&T	1 Gbps	1 Gbps	Yes		
Konocti Unified School District ³⁶ Office	9430-B Lake St	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes		

³⁶ *The Konocti Unified School District currently shares a 1 Gbps symmetrical circuit. Plans are being developed to upgrade capacity for these sites in the 2024-2025 school year.



Appendix A Community Anchor Institutions						
Institution Name	Address	Current Internet/ Network Provider	Forward Speed	Return Speed	Is a Plan With Higher Speeds Available?	
Blue Heron School (9-11)	15850-A Dam Road Ext	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Burns Valley Elementary School (K-7)	3620 Pine St.	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
East Lake Elementary School (TK-4)	13050 High Valley Rd	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Highlands Academy (3-8)	9707 Winchester St	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Konocti Adult School (18+)	9345 Winchester St.	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Konocti Education Center	9430B Lake St	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Lewis Center (Independent Study) (K- 12)	9707 Winchester St	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Lower Lake Elementary School (TK-7)	9240 Lake St	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Lower Lake High School (9-12)	9430-A Lake St	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Obsidian Middle School	15850-A Dam Rd	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
Pomo Elementary School (TK-7)	3350 Acacia St	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	
William C. Carle High School (Cont.) (10-12)	9430B Lake St	AT&T	Shared 1 Gbps Circuit*	Shared 1 Gbps Circuit*	Yes	



Appendix A Community Anchor Institutions							
Institution Name	Address	Current Internet/ Network Provider	Forward Speed	Return Speed	Is a Plan With Higher Speeds Available?		
Lake County Office of Education	1152 South Main St	AT&T	1 Gbps	1 Gbps	Yes		
Clearlake Creativity School	6945 Old Highway 53	AT&T	1 Gbps	1 Gbps	Yes		
Lakeport Unified School District Office	2508 Howard Ave	AT&T	1 Gbps	1 Gbps	Yes		
Clear Lake High School (9-12)	350 Lange St	AT&T	1 Gbps	1 Gbps	Yes		
Lakeport Alternative School	2548 Howard Ave	AT&T	1 Gbps	1 Gbps	Yes		
Lakeport Community Day School	2548 Howard Ave	AT&T	1 Gbps	1 Gbps	Yes		
Lakeport Elementary School (K-3)	150 Lange St	AT&T	1 Gbps	1 Gbps	Yes		
Natural Continuation High School (9- 12)	2508 Howard Ave	AT&T	1 Gbps	1 Gbps	Yes		
Terrace Middle School (4-8)	250 Lange St	AT&T	1 Gbps	1 Gbps	Yes		
Lucerne Elementary School District Office	3351 Country Club Drive	AT&T	1 Gbps	1 Gbps	Yes		



Appendix A Community Anchor Institutions							
Institution Name	Address	Current Internet/ Network Provider	Forward Speed	Return Speed	Is a Plan With Higher Speeds Available?		
Lucerne Elementary School	3351 Country Club Drive	AT&T	1 Gbps	1 Gbps	Yes		
Middletown Unified School District Office	20932 Big Canyon Road	AT&T	1 Gbps	1 Gbps	Yes		
Cobb Mountain Elementary School (K- 6)	15895 Hwy 175	AT&T	1 Gbps	1 Gbps	Yes		
Coyote Valley Elementary School (K-6)	18950 Coyote Valley Rd	AT&T	1 Gbps	1 Gbps	Yes		
Lake County International Charter School	15850 Armstrong St	AT&T	1 Gbps	1 Gbps	Yes		
Loconoma Valley High School (Continuation School)	20932 Big Canyon Rd	AT&T	1 Gbps	1 Gbps	Yes		
Middletown Com. Day School	20932 Big Canyon Rd	AT&T	1 Gbps	1 Gbps	Yes		
Middletown High School (9-12)	20932 Big Canyon Rd	AT&T	1 Gbps	1 Gbps	Yes		
Middletown Middle School (7-8)	20932 Big Canyon Rd	AT&T	1 Gbps	1 Gbps	Yes		
Minnie Cannon Elementary School (K- 6)	20931 Big Canyon Rd	AT&T	1 Gbps	1 Gbps	Yes		



Appendix A Community Anchor Institutions							
Institution Name	Address	Current Internet/ Network Provider	Forward Speed	Return Speed	Is a Plan With Higher Speeds Available?		
Upper Lake Unified School District Office	675 Clover Valley Rd	AT&T	1 Gbps	1 Gbps	Yes		
Upper Lake High School (9-12)	675 Clover Valley Rd	AT&T	1 Gbps	1 Gbps	Yes		
Upper Lake Elementary School (K-5)	679 2nd St	AT&T	1 Gbps	1 Gbps	Yes		
Upper Lake Middle School (6-8)	725 Old Lucerne Rd	AT&T	1 Gbps	1 Gbps	Yes		
Redbud Library	14785 Burns Valley Rd	AT&T	Shared 1 Gbps Circuit	Shared 1 Gbps Circuit	Yes		
Middletown Library	21256 Washington St	AT&T	Shared 1 Gbps Circuit	Shared 1 Gbps Circuit	Yes		
Upper Lake Library	310 Second St	AT&T	Shared 1 Gbps Circuit	Shared 1 Gbps Circuit	Yes		
Lakeport Library	1425 N High St	AT&T	Shared 1 Gbps Circuit	Shared 1 Gbps Circuit	Yes		
Courthouse-Lakeport	255 N Forbes Street	AT&T	1000 Mbps	1000 Mbps	Yes		
Central Dispatch	1355 Hoytt	WAN	WAN Connection	n to Courthouse	Yes		



Appendix A Community Anchor Institutions									
Institution Name	Address	Current Internet/ Network Provider	Forward Speed	Return Speed	Is a Plan With Higher Speeds Available?				
County Maintenance Yard	15970 Kugelman Road	WAN	WAN Connection to Courthouse		Yes				
County Maintenance Yard	4060 Finley East Road	WAN	WAN Connection to Courthouse		Yes				
Department of Public Health	922 Bevins Ct	WAN	WAN Connection to Courthouse		Yes				
Department of Social Services	15975 Anderson Ranch Parkway	WAN	WAN Connection to Courthouse		Yes				
Hill Road Correctional Facility	4913 Helbush Road	WAN	WAN Connection to Courthouse		Yes				
Middletown Sheriff Substation	21277 Calistoga Street	WAN	WAN Connection to Courthouse		Yes				
Office of Emergency Services (OES)	1375 Hoyt Avenue	WAN	WAN Connection to Courthouse		Yes				
Sheriff Admin	1220 Martin Street	WAN	WAN Connection to Courthouse		Yes				
Sheriff Main Station	1220 Martin Street	WAN	WAN Connection to Courthouse		Yes				
Sheriff Substation Lowerlake (65)	16354 Main Street	WAN	WAN Connection to Courthouse		Yes				



Appendix A Community Anchor Institutions									
Institution Name	Address	Current Internet/ Network Provider	Forward Speed	Return Speed	Is a Plan With Higher Speeds Available?				
Lake County Sanitation NW Regional TP	1155 Whalen Way	WAN	WAN Connection to Courthouse		Yes				
Lake County Sanitation SE Regional TP	2485 Old Highway 53	WAN	WAN Connection to Courthouse		Yes				



IX. <u>GLOSSARY</u>

5G: Fifth generation of cellular broadband technology used for both mobile and fixed wireless broadband Internet systems. 5G provides substantially more upload and download capacity than current 4G systems.

25/3: (25 Mbps download by 3 Mbps upload): Minimum speed to be considered "Underserved" by broadband.

100/20: (100 Mbps download by 20 Mbps upload): Minimum speed to be considered "Served".

Bandwidth: In networking, Bandwidth is the maximum amount of data that can be transported in a fixed amount of time, i.e., 1 Mbps is 1 million bits transported per second.

Bit: The smallest unit of measurement of data. A bit is either a "1" or "0". For reference, a Byte is comprised of 8 bits.

Broadband: High speed Internet connectivity to one or more physical locations. The FCC currently defines broadband as at least 25 Mbps download and 3 Mbps.

Broadband Serviceable Location (BSL): A term used for the FCC's Broadband Map. A business or residential location in the United States at which mass-market fixed broadband Internet access service is, or can be, installed. FCC BSL definition: <u>https://help.bdc.fcc.gov/hc/en-us/articles/16842264428059-About-the-Fabric-What-a-Broadband-Serviceable-Location-BSL-Is-and-Is-Not</u>

Cable Modem: User network interface utilized on DOCSIS networks.

DOCSIS (Data Over Cable Service Interface Specification): Telecommunications standards for transporting data over cable systems.

CPUC: The California Public Utilities Commission.

Digital Equity: A state of digital inclusion where the gap between populations that have access to broadband and those that do not has been closed. This includes providing broadband availability to people who reside in areas where it does not exist as well as mitigating, overcoming and resolving all other reasons for non-adoption where broadband does exist.

Download: Transfer of data from one location to another over a network. Download refers to the information being received by the end user (Upload refers to the data sent out by the end user).





DSL (Digital Subscriber Line): Internet connectivity over traditional copper telephone landlines to the end user's location.

FCC – Federal Communications Commission – Federal Regulatory Agency that regulates communications in the United States.

Fiber-to-the-premises/fiber-to-the-home (FTTP/FTTH): A network comprised entirely of fiber optic infrastructure from the ISP to the end users' locations.

Fixed wireless: Wireless networks that connect from the ISP to static or stationary locations; i.e., from transmit antennas mounted on buildings or towers to receive antennas at user locations.

Gbps (gigabits per second): The transport of 1 billion bits (1,000 Mbps) per second over a network.

HFC: Hybrid Fiber Coaxial. Network architecture utilized by cable or cable TV networks.

Hotspot: Usually a reference to WiFi connectivity. A physical location where an end user's device can access a network and the Internet, most often via a wireless network.

IoT: Internet of Things, means the connected devices, systems, software and other technologies that communicate over the Internet to seamlessly exchange data between each other and the cloud. IoT enables a host of "Smart" applications (e.g., Smart Home, Smart Grid)

ISP: Internet Service Provider

Last Mile: The last segment of a telecommunications network that connects to the end user's facility. Note that "Last Mile" is not a definition of distance as is the case with a statute mile.

Mbps (megabits per second): The transport of 1 million bits per second over a network.

Middle Mile: High capacity short or long-haul backbone infrastructure. Also referred to as "transport" or "backhaul" infrastructure. Note that "Middle Mile" is not a definition of distance as is the case with a statute mile.

NTIA: National Telecommunications and Information Administration. <u>https://www.ntia.gov/</u>

Served: A BSL that has *reliable broadband service* offered with a speed of 100 Mbps or higher for downloads; and a speed of at least 20 Mbps for uploads.





Unserved: A BSL that has no access to *reliable broadband service* offered with a speed of 25 Mbps or higher for downloads; and a speed of 3 Mbps or higher for uploads. 25 Mbps/3 Mbps.

Underserved: A BSL that has *reliable broadband service* offered with a speed of 25 Mbps or higher but less than 100 Mbps for downloads; and a speed of at least 3 Mbps but less than 20 Mbps for uploads.

Upload: Transfer of data from a user location to an ISP over a network. Upload refers to the information being sent out by the end user (Download refers to the data being received by the end user)

USDA: United States Department of Agriculture. <u>https://www.usda.gov/</u>

USEDA: United States Economic Development-Administration. https://www.useda.gov

WiFi: Specific standardized radio signals utilized to connect smart devices to a network and the Internet.



